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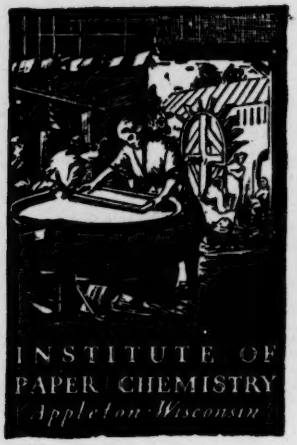
BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

LIBRARY NOTES

MAY • 1949

Volume 19 Number 9

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Periodicals, Books, and Pamphlets Added to the Library During April

BAGASSE

WEST, CLARENCE J., ed. The utilization of sugar cane bagasse for paper, board, plastics, and chemicals; an annotated bibliography. Scientific report series supplement to no. 3. New York, Sugar Research Foundation, Inc., 1949. 20 p.

CONTAINERS

FAULSTICH, C. B., and BRADLEY, W. B. Packaging of bakery products; a review and annotated bibliography [Chicago, American Institute of Baking, 1949-] Loose-leaf.

ENGINEERING—BIBLIOGRAPHY

GILBERT ASSOCIATES, INC. Reference bibliography for water, sewage & power plant engineering [New York, etc.] Gilbert Associates, Inc., 1949. 34 numb. leaves.

ENZYMES

TAUBER, HENRY. The chemistry and technology of enzymes. New York, Wiley [c1949] 550 p.

FOREST PRODUCTS

VERMONT WOOD PRODUCTS CONFERENCE, *Norwich University, Northfield, Vermont.* Seventh and eighth report of the Vermont Wood Products Conference, 1947-1948. Northfield, The Vermont Bureau of Industrial Research, 1947-48. 2 v. 31 and 35 processed leaves.

FORESTS AND FORESTRY

BALDWIN, HENRY I., and HEERMANCE, EDGAR L. Wooden dollars; a report on the forest resources of New England, their condition, economic significance and potentialities. Boston, Federal Reserve Bank of Boston, 1949. 127 p.

[U. S. FOREST SERVICE] Forests and national prosperity; a reappraisal of the forest situation in the United States. U. S. Dept. of Agriculture. Miscellaneous publication no. 668. Washington, U. S. Govt. Print. Off., 1948. 99 p.

FRENCH LANGUAGE

ARGY, M., and SUPPER, H.-L. Vocabulaire papetier Français-Anglais et Anglais-Français des industries papetières et graphiques. Paris, Édition de "La Papeterie" [1948] 231 p.

GERMAN LANGUAGE

LINGEN, ALFRED W. English-German dictionary of technical words, paper, printing, official correspondence (questionaires, reports, applications, etc.). Paderborn, Ferdinand Schöningh, 1947. Part I. English-German. Part II. Deutsch-Englisch. 208 + 193 p. in 1 v.

INDUSTRIAL MANAGEMENT

RAUTENSTRAUCH, WALTER, and VILLERS, RAYMOND. The economics of industrial management. New York, Funk & Wagnalls Co. in association with Modern Industry Magazine [c1949] 451 p.

MATERIALS—DETERIORATION

[GREAT BRITAIN] *Ministry of Supply. The Directorate of Chemical Research and Development,* and *Department of Scientific and Industrial Research,* comp. Tropic proofing, protection against deterioration due to tropical climates. London, H. M. Stationery Office, 1949. 32 p.

MICROSCOPE AND MICROSCOPY—TECHNIQUE

CLAYDEN, E. C. Practical section cutting and staining. London, J. & A. Churchill Ltd., 1948. 129 p.

PAPER SPECIALTIES

The PAPER year book, 1949. Bernard Seltzer, editor. Chicago, Davidson Publishing Co., c1949. 592 p.

The seventh annual edition is an enlarged revision of previous yearbooks, including new developments and specifications. One significant change in the arrangement of the material has been made in that the main section, previously called "Paper and paper products data," is now divided into two sections: "Coarse paper and paper products data" and "Fine paper and printing paper data." Under each heading in both sections are listed the construction details, sizes, weights, packaging, principal uses, sales points, sales opportunities, sources of supply, and similar pertinent data. The separation into two major classifications is believed to facilitate the profitable use of this reference book.

PAPER WORK

DAY, FREDERICK T. Colour paper decoration. London, C. Arthur Pearson, Limited [1948] 128 p.

PRINTING

The PENROSE ANNUAL, a review of the graphic arts. Ed. by R. B. Fishenden. London, Lund Humphries & Co. Ltd., 1949. v. 43. Various paging.

PUMPING MACHINERY

ECONOMY PUMPS, INC., *Hamilton, Ohio.* [Pump engineering data] Hamilton, Ohio, Economy Pumps, Inc., c1948. 416 p.

WASTE PRODUCTS

WASTE TRADES MANUAL and directory, the only directory and year-book of the world's waste material trade and reclamation industry, sponsored by The Waste Trade Federation. Ed. by Gordon Hughes. London, etc., British Continental Trade Press Ltd., 1948. 346 p.

WATER—POLLUTION

[GREAT BRITAIN] *Department of Scientific and Industrial Research.* Flax retting with aeration; a process of re-using an industrial waste water. Water pollution research, technical paper no. 10. London, H. M. Stationery Office, 1948. 146 p.

MOGGIO, W. A. Storage studies on kraft mill wastes; report of investigation conducted by the Engineering Experiment Station, Louisiana State University and the National Council for Stream Improvement. Engineering Experiment Station Bulletin series no. 13. Baton Rouge, La., The University, 1948. 26 p.

SOUTHGATE, B. A. Treatment and disposal of industrial waste waters [Gt. Brit.] Department of Scientific and Industrial Research. London, H. M. Stationery Office, 1948. 327 p.

YEAST

SCHLEEF, MARGARET L. The economics of fodder yeast from sulfite waste liquor. The State College of Washington. School of Economics and Business. Bureau of Economic and Business Research. Economic and business studies. Bull. no. 7. Pullman, Wash., The Bureau, 1948. 43 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ADHESIVES

McLAREN, A. D., and SEILER, CHARLES J. Adhesion. III. Adhesion of polymers to cellulose and alumina. J. Polymer Sci. 4, no. 1: 63-74 (February, 1949); *cf.* B.I.P.C. 19: 299.

A relationship between tack temperature and molecular weight has been deduced and illustrated with polyvinyl acetate polymers. Provided the molecular weight is high enough to prevent cohesive failure, the adhesion of polyvinyl acetate to cellulose and aluminum is independent of molecular weight. The influence of humidity on adhesion of polymers to cellulose is shown. The influence of polymer composition on adhesion is illustrated with copolymers of vinyl acetate and methyl vinyl ketone and of styrene and methyl vinyl ketone. Above a mole fraction of ketone of 0.8, adhesion increases rapidly. The interdependence of tack temperature and composition on adhesion is exemplified with ethylene-vinyl chloride copolymers. A temperature dependence of adhesion is cited for copolymers containing maleic acid. 16 references. E.S.

R. A. The pasting of waxed or paraffined papers. Neue deut. Papier-Ztg. 3, no. 4: 135-6 (Feb. 28, 1949). [In German]

Reference is made to the development of special adhesives for waxed and paraffined papers and boards (nature not disclosed), so that it is now no longer necessary to paste the articles first and impregnate them with wax afterward. Before selecting the adhesive for such an application, the type of material (hard or soft), the printing inks (if the surfaces are printed), and the use requirements of the finished article must be taken into consideration. E.S.

ADHESIVES—TESTING

SILVER, IRVING. Shear impact and shear tensile properties of adhesives. Modern Plastics 26, no. 9: 95-7, 136-8 (May, 1949).

A report is given of the behavior of bonded joints under shear impact and shear tensile forces; only room temperature-setting adhesives, pulp-filled phenolic, and commercial brass were used. Factors studied included a statistical analysis of shear impact data, adhesive thickness and shear impact strength, exposure to heat, surface preparation (sanding) of phenolic specimens, testing at −40° and +170° F., and setting rates. It was found that the shear impact method is reproducible and reliable when the thicknesses of the adhesive bond are constant. The method can be employed to detect weaknesses in a joint which are not apparent in the standard strip shear tensile test, especially when the joint specimens have been exposed to heat or are tested at low temperatures, or when variations in sanding the phenolic surfaces have occurred. Of the three types of adhesives studied—air-dry solvent, resorcinol, and polysulfide—the resorcinol adhesives set most quickly. Data are given in six tables. R.R.

ALKALINE PROCESSES

BRINGMAN, R. E., PASCOE, T. A., and KAHN, J. M. New process for making white liquor. Paper Ind. 31, no. 1: 64-6 (April, 1949); *cf.* B.I.P.C. 17: 4.

An improved process for making sulfate cooking liquor in pilot plant experiments is described briefly. Coagulation by the addition of magnesium sulfate to both green and white liquors was found to accelerate clarification and improve the properties of both muds and liquors. The magnesium hydrate floc absorbs most of the impurities in the green liquor, such as iron, silica, and suspended solids. The process allows the use of smaller settling tanks. Centrifugals may be used to dewater the final mud and also to separate the cooking liquors. Unit functions of the process may be incorporated into older conventional installations. 3 figures and 2 tables. L.E.W.

ALUM

STRACHAN, JAMES. The production of alum, alumina and aluminium from China clay. Paper-Maker (London) 117, no. 3: 164 (March, 1949).

With reference to the research and pilot plant on a manufacturing scale for producing pure alumina from the Tennessee Valley clays, the author states that Great Britain is building up an enormous aluminum-consuming industry, for which every pound of the necessary raw material has to be imported. He emphasizes the possibilities of the China clay deposits in Cornwall and Devon as a source of alumina and aluminum. E.S.

ASSOCIATIONS

BLACK, DON H. LFT marks 25th year, looks to new research. Modern Lithography 17, no. 4: 28-31, 97, 99 (April, 1949).

A summary is given of the history of the Lithographic Technical Foundation, some of its most important accomplishments, and its present research, educational, and training activities. R.R.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Condensations of annual meeting papers. Tappi 32, no. 3: 48A, 50A, 52A, 54A, 56A, 58A, 60A, 62A (March, 1949); Paper Ind. 30, no. 12: 1808, 1810, 1812, 1814-16, 1818, 1820-2 (March, 1949); Southern Pulp Paper Manuf. 12, no. 3: 68, 70, 72-8; no. 4: 54, 56, 58-9 (March, April, 1949).

Abstracts of papers presented at the annual TAPPI meeting in February, 1949, in New York are given. The selection and sequence of the abstracts varies in the different references. E.S.

BACTERIOLOGY

BALOWS, ALBERT, and JENNISON, W. M. Thermophilic, cellulose-decomposing bacteria from the porcupine. J. Bact. 57, no. 1: 135 (January, 1949).

A culture of bacteria which decomposes cellulose rapidly has been isolated from the intestinal contents of a native porcupine. The organisms are very similar to certain thermophilic, cellulose-decomposing bacteria previously described by other workers. In a liquid medium containing 1.5% cellulose, most of the cellulose is destroyed in a week. E.S.

REED, G. B., and MCKERCHER, D. G. Surface growth of bacteria on cellophane. Can. J. Research 26 E, no. 6: 330-2 (December, 1948).

A method is described for the cultivation of bacteria on the surface of cellophane sheets spread over layers of absorbent material, such as filter pulp, absorbent cotton, bran meal, peat, etc., saturated with any desired fluid medium. Various grades of cellophane (with the exception of moistureproof) are satisfactory; the only difficulty in handling the material is to prevent curling of the cellophane in the autoclave. This can be accomplished by avoiding the formation of a vacuum on cooling. The method is of value where larger surfaces than those provided by ordinary Petri dishes are required; it has proved to be useful in preparing suspensions of bacteria reasonably free from contamination by the culture medium. E.S.

BARK

KURTH, E. F. The chemical analysis of western woods. Part II. Douglas fir bark analysis. Tappi 32, no. 4: 175-6 (April, 1949); *cf.* B.I.P.C. 18: 478.

Douglas fir bark and its mechanically separated components were analyzed by conventional wood-analysis methods. The application of the cellulose procedures to these materials appears to be impracticable. Cork is relatively insoluble in 72% sulfuric acid; hence, analytical specimens containing cork will give inaccurate lignin values. The "lignin" residue from the short needle-like fibers contains less than one half of the methoxyl content of softwood lignins. An acetic acid content of 3.3 to 5.1% of the fibrous component is indicated. E.S.

BEATING

HÄGGLUND, ERIK, and WEBJÖRN, BARBRO. The hardness of pulps. Svensk Papperstidn. 52, no. 6: 131-7 (March 31, 1949). [In German; Swedish and English summaries]

Pulps were prepared by heating chips of varying sizes with aqueous sodium bisulfite at 100° C. over a period of about 16 days, changing the cooking liquor every fourth day. At the end of this time period, the pulp yields were about 52%, and the lignin content had dropped to 0.3%. However, this pulp resisted defibering and, especially in the case of those pulps prepared from thin chips, hydration in a Lampén mill proved difficult. Pulps prepared from the same wood and containing, respectively, 5.2% and 8.9% lignin could be hydrated just as readily or more readily than could the lignin-free pulps. Semichemical pulps (obtained in about 75% yield) were also prepared from two different samples of sprucewood. These retained, respectively, 14.1 and 15.9% lignin and were very resistant to hydration. However, when these same pulps were delignified with chlorine dioxide, the rate of hydration increased markedly and, in the case of one pulp, all the strength properties increased sharply. In the other (chlorited) pulp, the folding endurance showed a decided increase and none of the other strength properties decreased. When too high a proportion of low molecular weight polyoses is present in a pulp (i.e., in a holocellulose) hydration is also impaired. The fibers are "stiff" and photomicrographs show that they adhere closely to each other. Only by using a Turmix apparatus could effective hydration be obtained. Mild alkaline or hypochlorite treatment, which removes a part of the surface layer from the holocellulose, also results in a pulp that is easily beaten. Fibers obtained by using an Asplund defibrator were also converted into "chlorite holocellulose" (yield 67% with 2.4% lignin). This material could be processed in a Lampén mill to 44° S.-R., giving a pulp with good

strength properties, thus indicating that the Asplund process (carried out at 170°) attacks the fiber surfaces sufficiently to insure adequate hydration of the pulp after delignification. In summing up their results, the authors state that the ease of hydration (or defibering) of a pulp cannot be gaged simply by its lignin content. On the other hand, the percentage of the polyoses (hemicelluloses of low molecular weight) seems very important in affecting pulp quality. When these polyoses are selectively removed (as in the case of a slow but thorough delignification at 100° C.), hydration and pulp quality are adversely affected. In other words, hemicelluloses of higher D.P. (i.e., those approaching cellulose) do not contribute greatly to the hydration of the pulp. When sufficient lignin is left in the pulp to cover or protect the polyoses of low D.P. adequately, the resulting pulp is also very difficult to beat. However, as soon as this lignin is removed by chlorite, hydration is accelerated. The authors discuss their findings at some length. 15 references.
L.E.W.

BOARD

ANON. New pulp process makes hardboard from veneer waste. Western Pulp and Paper 2, no. 4: 6-7 (April, 1949).

The Pacific Veneer and Plywood Division of Canadian Forest Products Ltd., Westminster, B.C., is the first veneer plant to produce hardboard from its own veneer and plywood waste; it is also the first Canadian plant to use the Chapman process. A 66-inch Sumner chipper reduces the waste to ¾-inch chips, which are screened and then broken into long fiber bundles in Asplund Defibrators. A Bauer single-disk refiner mixes the fiber with white water from the return system. Liquid phenol-formaldehyde resin and Paracol (a paraffin emulsion) are added to the pulp slurry in a DeZurik consistency regulator. The stock, at 2.5% consistency, flows to the storage chests, after which alum is added as it is pumped to the machine chest. A metering box discharges about 80 cu. ft./deckle box. The wet laps, three or four inches thick, are reduced in a hydraulic press operating at 200 p.s.i. to a thickness of 1¼ inches, and further reduced to ¼ inch in a platen press operating at an initial pressure of 400 p.s.i. and a temperature of about 360° F. The board is kept in a humidifying chamber for four hours to stabilize the moisture content at 4-5%. Tests are made for pulp freeness, pH of stock, board strength, and sizing density. The finished sheets are 4 × 8 feet, have a hard glossy surface which is highly resistant to scratching and marring, and can be thoroughly covered with one coat of paint or stained to any desired shade. R.R.

BOARD MILLS

ANON. Unique equipment in Michigan; Monroe mill expands. Pulp & Paper 23, no. 4: 54, 56, 58 (April, 1949).

The three-year modernization program of the River Raisin Paper Co., Monroe, Mich., which should be completed this year at a cost of about $3,250,000, includes rebuilding the No. 3 and No. 4 cylinder board and No. 5 strawboard machines, new Monel piping, seven Bird Machine Co. screens and six Miami jordans for each of the cylinder machines, new stock-preparation equipment, a new power plant including a boiler, stokers, and turbine-generators, a white-water treating system, and corrugating-room units for fabricating and finishing. Production on the machines, rebuilt by Black-Clawson Co., has been increased by 25%. Monel piping has been used for new white-water lines on the No. 3 and No. 4 machines and for all stock lines and complete jordan piping on the No. 4 machine. A new Infilco Cyclator treats white and waste water from the two board machines before the effluent is discharged into the stream. It recovers about 4 tons of fiber per day; the treatment removes 94% of the suspended solids. R.R.

BOARD MILLS—WASTE LIQUOR

ASPLUND, A. The white-water problem of the wallboard industry. Svensk Papperstidn. 52, no. 4: 79-86 (Feb. 28, 1949). [In Swedish; German and English summaries]

The white-water problem in wallboard mills is discussed from the angle of the economics of mill operation and of stream pollution. Hardboards require cleaner process water than insulating or porous boards, so that the fresh-water consumption amounts to about 60 cu. m./ton of hardboards and to only 15-25 cu. m./ton of insulating boards. About 5% of the wood substance is dissolved during the manufacturing process and appears in the white water, apart from fibrous, size, and alum residues. The fiber loss amounts to approximately 15 kg./ton of board and 50 cu. m. of fresh water used. The temperature of the process water during the mill cycle increases approximately 10-15° C., making water treatment for slime prevention, particularly during the hot season, imperative. Possible toxic effects from the white water on fish life are discussed under the headings: poisonous substances, oxygen depletion, and turbidity. Wallboard mills, as a rule, do not make use of substances toxic to fish, with the exception of those impregnating their board for use in the tropics. In those cases, arsenic salts, pentachlorophenol, etc., may find application. The Swedish mills which make this type of board are situated near such large water bodies that no dangerous pollution is likely to result. Dangerous oxygen depletion may occur during periods of low water flow and high temperatures. Turbidity of the water may also increase to such an extent that fish start to migrate from the vicinity of such mills. Reference is made to chemical methods for flocculating the fibrous residues, which either sink to the bottom or, by means of air bubblers, rise to the surface of the treating vessel from which they are removed. Considerable progress has been made in the United States along this line since 1940. However, the cost of the chemicals involved is usually higher than the value of the product which is recovered. E.S.

BONDED FIBER WEBS

ANON. Non-woven filler for laminates. Modern Plastics 26, no. 9: 70-1 (May, 1949).

A new group of bonded fabrics, known as Lantuck, are available from the West Point Manufacturing Co., West Point, Ga., for use as fillers in high- and low-pressure laminates and coated fabrics. Unlike other bonded fabrics, they have an almost completely random distribution of fibers and, therefore, are equally strong in all horizontal directions. Six standard variations differ from each other in the fiber used, the structure or style of the filler, and the type and amount of resin used in the bonding, depending on the proposed application. In general, the new fillers cost 10-15% less than comparable woven fabrics, but cannot compete in price with paper. The first standard application is in the new RN-30 industrial laminate made by The Formica Co., Cincinnati, Ohio, which is claimed to have a lower moisture pickup than woven fabric laminates, improved impact strength, exceptionally good cold-punching properties, a smoother finish, and the ability to be machined at higher speeds. Data are tabulated on the physical properties of Lantuck laminates and commercial laminates using woven cotton fabrics and ASTM and NEMA specifications. R.R.

SHEERAN, S. R. "Fabrics" without weaving. Dupont Mag. 43, no. 2: 16-17 (April, 1949).

Nonwoven fabric towels, napkins, and tablecloths, such as those called "Masslinn" made by Chicopee Mills, Inc., consist of webs of cotton and/or

rayon fibers laid one upon the other to form a "lap," the face of which is treated with a special polyvinyl acetate-emulsion adhesive (Elvacet) to bind each fiber in place. The adhesive may be laid down to form designs and may be colored to make the article more attractive. Nonwoven flame-resistant fabrics are used for draperies and display materials. All-cotton material has a brilliant white surface; all-rayon, a silky finish with a high sheen. The fabrics may be dyed or printed. R.R.

CALCULATIONS

WAERN-BUGGE, T. The reaction periods and concentrations in a tank through which a liquid flows continuously. Svensk Papperstidn. 52, no. 3: 64-6 (Feb. 15, 1949). [In Swedish; English and German summaries]

Calculations and diagrams are given for determining the concentration (m) in a tank equipped with an agitator, through which a liquid flows continuously and to which at a certain moment a small amount of a material B is added. The decrease in concentration with time corresponding to one revolution is discussed mathematically. One diagram shows the amount of m lost with the effluent per time unit, and a second diagram shows the corresponding values for a second similar tank connected in series. E.S.

CELLOPHANE

ANON. "Enrobed" cheese. Modern Packaging 22, no. 8: 175 (April, 1949).

To preserve natural Swiss cheese, which ordinarily has a shelf life of only about two weeks, a new process has been devised whereby half-pound blocks are coated with melted cheese, overwrapped, and sealed in a coated cellophane. The blocks are automatically ejected into expanded cellophane pouches moving in cups on a conveyor belt—the pouches receive a preliminary charge of the liquid cheese. Compressed air completes the spreading of a ⅛-inch coating. The pouches are then folded shut and sealed by the heat of the contents. Undersized pieces and scraps from the original cutting of the blocks provide the coating. The rotogravure-printed cellophane is coated on the inside with 65% amorphous wax plus resins, synthetic rubber, and other ingredients. This coating partially melts on contact with the melted cheese, thus making intimate contact with the cheese and excluding air. R.R.

CELLULOSE—DEGRADATION

RACE, E. The degradation of cotton during atmospheric exposure, particularly in industrial regions. J. Soc. Dyers Colourists 65, no. 2: 56-63 (February, 1949).

As an introduction, the author reviews the chemical reactions of cellulose on exposure to air, sunlight, and atmospheric moisture and the reactions used to recognize and, to a limited extent, to assess quantitatively the oxidation products. Cellulose is not attacked by molecular oxygen. Three possible explanations are given and discussed for the oxidation of cellulose during exposure to atmospheric oxygen: (1) The cotton substrate acts as an activator and the oxygen is converted into ozone which degrades the cellulose; however, it is very unlikely that this takes place. (2) Photochemical degradation is a precursor of oxidation. (3) Ultraviolet radiation activates without degrading the cellulose, which is then capable of being attacked by gaseous oxygen. It seems that irradiation prepares the ground upon which the oxygen is able to attack the cellulose, possibly by rupturing the cross linkages between the cellulose chains and also either by weakening glycosidic

linkages so they can be broken later under direct attack by gaseous oxygen or by causing an intramolecular rearrangement within individual anhydroglucose units which gives a modified structure that is stable in nitrogen but not in oxygen. After short periods of exposure to sunlight, a small degree of degradation occurs during post-exposure dark storage; after longer periods, there is little post-exposure degradation and none as spectacular as that found with artificially irradiated cellulose. Presumably any activation occurring during exposure to direct sunlight is largely dissipated during the hours of darkness, only a residuum of ruptured activated linkages remaining for the storage period. During a second or third month's exposure, the photochemical activation slows down sufficiently for the rupture of all weakened or modified linkages to occur during the hours of darkness, leaving none for the post-exposure storage period. One of the best reagents capable of providing resistance to cellulose degradation during exposure to light and air is chromium oxide; some sulfur dyes, anthraquinone vat dyes, and substantive azo dyes also show such action, although to a lesser degree. Red indigoid vat dyes and certain Sulfur blacks accelerate the decomposition. Data given show that the loss in breaking strength of yarn exposed in an industrial region is greater during the winter months than in the summer; the smallest loss is in spring and autumn. Degradation during the summer arises from the action of ultraviolet radiation and atmospheric oxygen, in winter from those factors and the acid in the moisture; in the spring and fall, the atmospheric acidity is approximately the same as that during the summer, but the amount of daylight is less. The greater atmospheric acidity in industrial areas in winter is caused by the increased domestic fuel consumption and the quiet of the atmosphere during the winter fogs. 15 references. R.R.

CELLULOSE ETHERS

TIMELL, TORE. Investigations on cellulose reactions. VI. Note on the formation of carboxymethyl- and sulphoethylcelluloses. Svensk Papperstidn. 52, no. 3: 61-3 (Feb. 15, 1949). [In English; Swedish and German summaries] *cf.* B.I.P.C. 19: 386.

In order to obtain information on the relative activity of the primary and secondary hydroxyl groups of cellulose in the formation of ether derivatives, four carboxymethylcelluloses from different sources and a series of nine sulfoethylcelluloses covering a wide range of substitution were investigated. The free glycol groups remaining were determined by oxidation with periodate. Using the criterion of Mahoney and Purves (*cf.* B.I.P.C. 12: 177-8) that the number of glycol groups (G) as a rule is equal to $H/2$ or $H^2/4$ (where H is equivalent to the remaining free secondary hydroxyls), depending on whether the reaction has been heterogeneous or homogeneous, respectively, the author has calculated H for each sample from the number of glycol groups found. The values assuming $G = H/2$ are not reasonable, but those assuming $G = H^2/4$ are more plausible. The ratio of primary to secondary hydroxyls reacting, on the basis of these calculations, apparently decreases with increasing degree of substitution. In the formation of these two compounds, as well as with methyl and ethyl ethers, the primary hydroxyl seems to be as reactive at the beginning as the two secondary hydroxyls combined, but its reactivity decreases at higher degrees of substitution to the average reactivity of each of them. In certain cases, however, for causes which cannot be definitely identified at this time, the conversion of the primary hydroxyls seems to be checked. 17 references. M.A.H.

CELLULOSE FILMS, TRANSPARENT

CULLOM, WILLIAM F. Films for tomatoes. Modern Packaging 22, no. 8: 134-7 (April, 1949).

Because tomato packers were one of the first to use prepackaging, they have developed a good technique and gained information of interest to prepackagers of other fresh produce. About 85% of the tomatoes now sold in retail stores are prepackaged. Consumer units first appeared in 1930, in folding boxes with die-cut openings, but without a film covering the window. By the middle 1930's, the window was film-covered. About 1934 the transparent overwrapped tray or boat appeared with a variety of wrapping materials. During the war, when the development of materials and packaging machinery was retarded, work was done on the requirements of prepackaged tomatoes. It was found that their flavor and texture are likely to be affected if the carbon dioxide concentration in the package rises above 10%; under such circumstances, ripening is retarded. Cellulose acetate is the preferred film for windows and complete overwraps, chiefly because of its ability to "breathe," because it does not collect moisture on the inside to obscure the fruit, and does not shrink and wrinkle. Solvent sealers are used in the majority of these operations. R.R.

MOELTER, GREGORY M., and SCHWEIZER, ERNEST. Heat softening of cellulose acetate; effect of plasticizers. Ind. Eng. Chem. 41, no. 4: 684-9 (April, 1949).

By means of a creep test, softening temperatures were determined of cellulose acetate films plasticized with various plasticizers over a range of plasticizer contents. Softening temperature-plasticizer content curves were plotted from these data. It was found that the relation between softening point and plasticizer content can be expressed by the equation $t = t_0 e^{-kn}$, where t_0 is the softening temperature of the unplasticized cellulose, n the mole fraction of the plasticizer in the film, and k a constant termed the softening point depression coefficient. k is dependent on the nature of the plasticizer and is a measure of the extent of lowering of the softening temperature of the polymer by a mole fraction of the plasticizer and characterizes a plasticizer as regards its softening effect on the cellulose acetate. Plasticizers belonging to a homologous series have the same k value. Examples of softening temperature-plasticizer content graphs are given together with a table of k values and a table of plasticizer retentivities in cellulose acetate under heat softening conditions. E.S.

CHEMICAL TESTING—PAPER—ACIDITY

LITHOGRAPHIC TECHNICAL FOUNDATION. How to determine pH value of paper. Natl. Lithographer 56, no. 4: 38 (April, 1949); Graphic Arts Monthly 21, no. 4: 112 (April, 1949); Modern Lithography 17, no. 4: 33, 99 (April, 1949).

When paper or its coating is too acid or alkaline, the plate may scum or go blind with no sign of a transfer of the coating pigment to the blanket, or ink drying may be retarded. To determine the pH of uncoated stock, strips can be extracted with distilled water for about 15 minutes and the pH of the liquid determined with a glass electrode pH meter; values of 5.0 to 6.0 are satisfactory. With coated stock the determination is made by scraping off the coating, shaking the resulting powder with distilled water periodically for about 10 minutes, and determining the pH value of the liquid with a glass electrode pH meter. Normal clay coatings show values from 6.0 to 7.0; calcium carbonate coatings from 7.0 to 8.5. Cleanliness is of the utmost importance in making the determinations. Any pH values outside the range of 6.0 to 8.5 may have a harmful chemical reaction on the printing plate. Inks will dry normally on coatings of this pH range, when the relative humidity is below 50%. At higher humidities, the drying of some inks is seriously retarded on coatings of pH 6.0 to 7.0, yet they will dry normally on more alkaline coatings. R.R.

CHEMICAL TESTING—PULP—BETA AND GAMMA CELLULOSE

DOERING, HELMUT. Determination of the total alkali-soluble portion (of pulp); β- plus γ-cellulose. Das Papier 3, no. 3/4: 37-9 (February, 1949). [In German]

In determining β- plus γ-cellulose in the filtrate from the α-cellulose determination, it is not advisable to run wet combustions (with dichromate and sulfuric acid) on aliquots of the initial alkaline filtrate. The total filtrate and washings, when diluted and analyzed, gave substantially accurate results, but when only the first alkaline runnings were analyzed, the results were high. Data on 15 pulp samples are given. The summation of α-cellulose + β-cellulose + γ-cellulose ranged from 99.7-100.7%, when the wash waters were added to the initial filtrate. However, when the first alkaline runnings were analyzed alone, summations ranged from 100.6-101.9%. Inasmuch as the wet combustion of pure D-glucose gives values which are about 3-4% low, low rather than high summations would be expected. L.E.W.

CHEMICAL TESTING—PULP—CUPRAMMONIUM VISCOSITY

CENTRAL LABORATORY OF THE CELLULOSE INDUSTRY. *Analysis Committee.* Determination of the cuprammonium viscosity. Svensk Papperstidn. 52, no. 4: 86 (Feb. 28, 1949). [In Swedish] *cf.* B.I.P.C. 16: 93, 541.

With reference to the Swedish Standard CCA16 in which the pretreatment of the pulp sample with 190-210 g. of ammonia is prescribed, the fact is pointed out that such wide fluctuations in the ammonia content result in noticeable variations of the viscosity values. The Committee recommends, therefore, that the ammonia content be kept as close as possible to 200 g. (permissible limits 198-202 g. ammonia per liter). E.S.

CHEMICAL TESTING—SULFITE WASTE LIQUOR

LAGERSTRÖM, OLOF, SAMUELSON, OLOF, and SCHOLANDER, AXEL. The silica content of sulfite waste liquor. Svensk Papperstidn. 52, no. 5: 113-15 (March 15, 1949). [In Swedish; German and English summaries] *cf.* B.I.P.C. 17: 695-6.

A colorimetric method for the determination of silica in sulfite waste liquor is described. In order to remove the interfering calcium and ferric ions, the liquor is percolated through a layer of hydrogen cation exchanger (Wofatit KS). After evaporation and ignition, the ash is fused with sodium carbonate, the melt dissolved in hydrochloric acid and ammonium molybdate and, after standing for 10 minutes, citric acid is added. After dilution and filtering through Jena glass filters, the silica color intensity is measured immediately in a photometer. Temperature variations should not be greater than from 18-22° C. or the results will be affected. Data with various sulfite waste liquors are given. E.S.

CLAY

COUGHANOUR, L. W., and NORTON, F. H. Fundamental study of clay: IX. Influence of particle shape on properties of suspensions. J. Am. Ceram. Soc. 32, no. 4: 129-32 (April 1, 1949); *cf.* B.I.P.C. 19: 11.

The flow properties of suspensions containing monodisperse particles of muscovite, kaolinite, halloysite, and orthoclase were measured at various

concentrations to determine the influence of particle shape. It was found that the particle shape had a considerable effect in dispersed suspensions, the more isometric particles yielding the lower viscosity. Particle shape made no difference in flocked suspensions. 10 references. E.S.

COLORIMETRY

FRIELE, L. F. C., and SELLING, H. J. The measurement of color. II. Description of the fundamentals of the spectrophometric measuring technique. Mededeeling van het Vezelinstituut T.N.O. no. 75: 22 p. [1947] [In Dutch; English summary]

The principles of spectrometry and photometry are described, as far as they pertain to the spectrophotometry of materials which are not self-luminous, and with particular emphasis on photoelectric photometry. The possibilities of combining the spectrophotometer, photometer, and the sample, and the conditions of illumination and viewing of the sample (the geometry of the apparatus) are discussed. Brief reference is made to abridged spectrophotometry. Two instruments are described, the General Electric recording and the V.I. (N. V. Kipp's Instrumentenfabriek) spectrophotometers. 13 diagrams and 10 references. E.S.

SELLING, H. J. The measurement of color. I. A review and discussion of the I.C.I. standard observer and co-ordinate system for colorimetry. Mededeeling van het Vezelinstituut T.N.O. no. 75: 50 p. [1946] [In Dutch; English summary]

The important factors of color vision and analysis and of the standard I.C.I. system are discussed, as well as those which determine the color of light-reflecting and light-transmitting objects. The properties of the eye are treated briefly. Although colorimetric methods are not employed at the Vezelinstituut, they are discussed here in order to compare their results later on with those obtained by spectrophotometry, which are based on the I.C.I. standards. 15 diagrams, 9 tables, and 13 references. E.S.

CONTAINER INDUSTRY

U. S. DEPARTMENT OF COMMERCE. Packaging trends, prices, by areas. Packaging Parade 17, no. 195: 56-60 (April, 1949); Shears 76, no. 676: 34-6 (April, 1949).

As reported in the last issue of "Containers and packaging industry report," the raw materials outlook for the production of all containers is generally good. A discussion is given of conditions and trends in the industry for the various sections of the country for all types of containers. Folding-box production increased by 45% from 1940 to 1946. The estimated annual production for 1948 is about 2,200,000 tons. Indications are that there will be a general leveling off. The dollar volume of business done in the setup paper-box industry increased almost 100% from 1940 to 1947. An estimated decline of 5% is expected for 1948, and a probable additional 5% for 1949. The 1948 demand for paper shipping sacks rose about 15% over 1947 and will probably continue strong for the first half of 1949. The production of liquid-tight paper containers reached an all-time high in 1946; the 1947 figure was about 13% lower. Of special interest to the paper industry is a chart showing the dollar volume of business in selected paper and fiber containers for 1940-1948 and a table giving data on shipments of corrugated and solid fiber boxes for 1939-1948. The second reference refers to paper and paperboard items exclusively. R.R.

CONTAINER INDUSTRY—LAWS AND LEGISLATION

JANSSEN, WALLACE F. The slack-fill problem. Modern Packaging 22, no. 8: 144-7, 270 (April, 1949).

The author presents material taken from the hearings of three cases in which the presiding judge decreed that the Food and Drug Administration had no case against the defendent who was accused of slack filling, although the packages had from 33 to over 50% slack space. The decision was made on the basis of the facts that machine-filled packages cannot be filled as completely as hand-filled packages and that consumers recognize this and are therefore not misled by the size of the package. R.R.

COST—ACCOUNTING

MOORE, W. CLEMENT. A study of cost practices in the paper box industry. Shears 67, no. 675: 27 (March, 1949).

About 25 years ago, few paper-boxmakers showed interest in cost problems; those who did felt it too costly and complicated. Many used 100% of direct labor plus material cost to estimate the cost of production; later some added 15% for selling and administrative expense. After much study and practical application, the machine and operation hour method of cost finding and estimating was developed. This consists of the application and distribution of all manufacturing overhead expenses to each machine or operation in proper proportion. Pay is received in proportion to the expenditures for investment, maintenance, etc., and a reasonably correct price is obtained for the type and class of work produced. The real value of the system comes through its continuous practical use, checking actual production speeds and costs against estimates and, in the case of underproduction, determining where the fault lies. R.R.

DRYING—PAPER

WOODS, J. P. Hypothetical application of a heat pump to paper machine dryers. Pulp Paper Mag. Can. 50, no. 4: 70-4 (March, 1949).

In view of the general interest in the application of the heat pump, the author—at the request of the Heat and Power Committee—presents a review on this subject with reference to newsprint drying. A hypothetical application of a heat pump to the drying section is described as a basis for a theoretical analysis. Such an application has considerable theoretical merit. Although the horsepower to drive centrifugal compressors would be considerable and the capital outlay high, the potential reduction in live steam is immense. There are, however, very great practical difficulties to be overcome and it is not the purpose of the present paper to advocate such an installation. The principles involved are not new and similar schemes have been suggested from time to time. The potential benefits are such that this review has been considered worth while as a means of keeping the subject alive in the hope that the practical and economical difficulties will eventually be overcome. E.S.

DYES AND DYEING

GEAKE, A., and CLIBBENS, D. A. The absorption of the two vat dyes Caledon red BN and Caledon jade green by cotton. J. Textile Inst. 40, no. 1: T57-87 (January, 1949).

The authors describe an experimental study of the equilibrium absorption by scoured cotton of Caledon jade green (16,17-dimethoxydibenzanthrone) and of Caledon red BN (1,2-anthraquinonenaphthacridone) from alkaline solutions of their leuco compounds (vats). Some results are given also on the

rate of absorption of the leuco dyes by cotton from their vats. The chief variables considered are the concentration of dye and of neutral electrolyte in solutions of constant concentration in sodium hydroxide. The effect of pyridine in diminishing the absorption of the dyes by cellulose is correlated with its effect in raising the redox potential of the system formed by the solution of the leuco dye in equilibrium with the solid oxidized form. The rate of dyeing and, possibly, the equilibrium absorption are shown to be diminished if, before dyeing, the cotton is soaked in water or dilute aqueous solutions, and not dried prior to dyeing. The special apparatus and technique designed to give maximum accuracy in the measurements are described, and a number of data on the spectral absorptions of solutions of the purified dyes in various solvents are recorded. E.S.

FEED WATER

JONES, D. B., and WEITZEL, W. H. Treating water for use in paper mills. Tappi 32, no. 4: 171-4 (April, 1949).

Water requirements for use as boiler feedwater make-up and process are dependent on the physical design of the power plant and the quality of the manufactured product. Final decision as to the selection of the treating equipment is dictated by individual plant requirements and characteristics of the water supply. The adoption of supplementary treatment is often necessary to compensate for inadequacies of plant facilities. E.S.

FINANCE

ROBERTS, ARTHUR. Are your depreciation reserves adequate? Fibre Containers 34, no. 3: 24, 26 (March, 1949).

Replacement costs have increased considerably during recent years and are likely to remain high for some time; hence, the reserves for depreciation accumulated to date will not cover in many cases the outlays for replacements when they are needed. The Treasury does not allow a taxpayer to write off more than the original cost on depreciable assets and this prevents him from increasing his deduction in his income tax return to compensate him for the increased cost of construction and operating equipment. Boxmakers are usually lax in setting depreciation rates and keeping depreciation schedules. In the next year or so, many boxmakers will continue to buy new equipment at higher prices than those paid for the old equipment replaced. This will increase depreciation expense substantially at a time when a buyer's market in boxes will have come into full effect; in addition pressure will be exerted to lower costs. For this reason, the boxmaker must be far more precise in setting the higher depreciation rates and keeping records on them thereafter than he has in the past. He should take immediate steps to cushion any potential loss by opening a special reserve to take care of the increased costs of the new equipment. E.S.

SIECKE, KURT H. Capital expenditures now? Paper Trade J. 128, no. 12: 21-3; no. 16: 19-21 (March 24, April 21, 1949).

In two articles, the question "Capital expenditures now?" is answered in the affirmative. Illustrating with estimated operating costs and fixed annual charges for a 200-ton kraft paper mill "under favorable conditions," the conclusion is reached that the high construction costs and proportionally large investment in plant and woodlands need not deter the promoter from expanding at this time. The thesis that a new mill, incorporating the most up-to-date processes and equipment, will show lower unit operating costs than most of its competitors is illustrated also in estimated cost data for a sulfite mill. However, the assumption that "selling prices of finished products

have been established by economic conditions enabling even marginal mills to enter the market" needs much re-examination in the light of the events of the last few months. The author warns against arriving at erroneous results by using incomplete cost figures and inadequate conversion factors. Mill cost data and methods for their analysis will be discussed in a succeeding article. R.S.

WEST VIRGINIA PULP & PAPER COMPANY, *New York*. The cost of staying in business. Fibre Containers 34, no. 3: 41-2, 44 (March, 1949).

This article is taken from the annual report of the Company and describes the problems faced and the actual amounts needed to continue operations by one large pulp and paper manufacturer. Emphasis is on the cost of replacing facilities as compared with allowable depreciation; cost of remaining up-to-date; added burdens of pension plans, etc.; changes in wood supply and wood management; and disposal of wastes. Few of these costs are isolated; more often they are inextricably intermingled with each other. All of them must be covered by income from the product sold. The "cost of staying in business" has to be met before either wages or dividends are safe. E.S.

FOLDING BOXES

ANON. Swedish carton comes to U. S. Modern Packaging 22, no. 8: 120-3, 280, 282 (April, 1949).

Arrangements have been concluded for making possible the U. S. manufacture of a Swedish lined folding carton which is completely siftproof, automatically filled, and hermetically sealed and can be reclosed to make it virtually airtight. The pre-affixed liner, which may be of any material offering suitable protection for the product, extends about an inch beyond the full length of the carton blank at both top and bottom. The closing machine pulls the mouth of the liner together at one side while it folds in the side carton flaps and then the top flaps with the liner extension folded over between the latter. The top flap is spot glued to the one below. Bottom flaps are fully glue sealed to hold the weight of the contents and add to the carton's rigidity. For reclosing, a center tongue is torn in the top flap and tucked into the die-cut slot in the flap below. A completely automatic line, which is described and illustrated, turns out finished packages at speeds up to 2400/hr. and requires only two attendants. The new package, also illustrated, has been used in Sweden chiefly for coffee, pudding powders, and dehydrated foods. The American licensees forsee a much wider use in this country. R.R.

FOLDING PAPER BOX ASSOCIATION OF AMERICA. Boxed plums outsell bulk three to one. Shears 67, no. 675: 24 (March, 1949).

Consumer acceptance tests have shown that plums in cartons outsell the bulk fruit three to one and fruit in transparent bags three to two. Even with a price increase of 12.5 cents for the boxed article, it was favored five to four over the bulk. The recommended carton holds about one pound of plums and has a window as large as possible without making the strength inadequate. The board need not be specially treated, but air within the package must be changed, especially if refrigeration is lacking. Plain transparent cellophane or cellulose acetate is suggested for window material; the adhesive should be nontoxic and moistureproof. R.R.

FOLDING PAPER BOX ASSOCIATION OF AMERICA. Carton-and-chemical combination extends marketing life of cauliflower, stimulates sales. Shears 67, no. 676: 44, 46-7 (April, 1949).

Consumer acceptance tests show that cauliflower in boxes outsells the bulk product at a ratio of 7.5 to 1 at the same price and by 1.4 to 1 when the former is three cents a head higher. There is no great difference between the sale of the boxed and cellulose acetate-bagged vegetable. With refrigeration and a sprout inhibitor, which is best put in a carton or applied to the paperboard, the shelf life is extended. The use of boxes for immediate marketing makes possible the separation of the heads, the marketing of the edible portion alone, and the consequent speeding up of kitchen preparation; deterioration caused by light and poor ventilation is decreased; and the package is more easily handled and offers greater protection to its contents. A window in the carton is desirable to incorporate some visibility, but it should be as small as is consistent with marketing requirements. Any adhesive used on the carton should be waterproof. A square container with a tuck closure has been used successfully for packaging an entire head; if only the edible portion is packaged, a beers-type infold with a tuck cover is sufficient. R.R.

HAMILTON, GEORGE. Shears conducts a survey on carton stripping operations. Shears 67, no. 675: 20-1, 68 (March, 1949).

The trend today is to strip die-cut stock in a separate stripping area, rather than at the delivery end of cutting and creasing presses, although both systems are advantageous for certain jobs. Most of the work is done by hand; plants using mechanical hammers do so mostly on bulky work, sheets containing square boxes, and for the removal of outer trim. Although there is a definite place for women, especially for light table work and stripping inner trim, male help is far preferred. There is no standard method of removing waste; systems used include floor holes, pit balers, chutes leading to balers, conveyor systems directly below floor levels, and baling chambers mounted on the undersides of floors. About 37% of the industry uses jogging devices and another 17% employs some other type of registering device. R.R.

LAURIE, ALEX. Florists say it with pre-packaging. Packaging Parade 17, no. 195: 48-9, 61 (April, 1949); *cf.* B.I.P.C. 19: 546.

It is expected that prepackaged flowers will soon be available in both florist shops and grocery supermarkets. A research program conducted at Ohio State University has shown that the carbon dioxide given off by the flowers keeps them from maturing, and results in the sale of a fresher product. The flowers are packed in waterproof chipboard trays and misted with tap water to create a high humidity; the container is wrapped with a transparent film, which is heat-sealed. After packaging, the flowers are kept at 38-40° F. The ideal container is sized on both sides and cold water waxed on the inner surface to prevent moisture absorption. A notched cleat stapled to the sides of the box keeps the flowers in place. Either 300- or 450-gage cellophane that is transparent, moisture- and vaporproof, and heat sealable is used for the wrap. Consumer tests showed clearly that there is a definite need for a differentiation between packages sold through supermarkets and those sold by retail florists. R.R.

FOOD CONTAMINATION

FORSTNER, G. E. The occurrence of metallic contaminants in foods. Chemistry & Industry [67] no. 32: 499-501 (Aug. 7, 1948); *cf.* B.I.P.C. 19: 500-1.

The author discusses the main sources of food contamination by metals during manufacture, such as cans, cooking utensils, and processing equip-

ment. In conclusion, brief reference is made to the wrapping of foods. The possibility of cheese contamination by metal foils is mentioned. There is little likelihood of paper food wrappers themselves introducing metallic contaminants; however, care is necessary with the inks used to print such wrappers. Printing inks for food containers are normally free of heavy metals but, accidentally or carelessly, inks containing lead in the drier might be employed. E.S.

FORESTS AND FORESTRY

ALLEN, JAMES H. Here's a part of what the southern pulp and paper mills have done in forest development. Southern Pulp Paper Manuf. 12, no. 4: 60-4 (April, 1949).

The author compares conditions in southern forestry in 1933 with those of 1948 and shows the important part which the pulp and paper industry has played in this development. In 1933, southern mill capacity was estimated at 3000 tons per day with a capital investment of 105 million dollars. At the close of 1948, productive capacity had attained 19,500 tons per day, with a capital asset value of 624 million dollars. The paper industry has been conscious of the need for sound forestry practices, including such developments as tree farms, that will lead to the goal of sustained yield. In 1933, millions of acres of cut-over and second-growth pine had lapsed into tax delinquency, because owners felt that properties were not worth the taxes. Today, these acres have been converted into one of the most valuable assets possessed by the South. The annual crop of wood fibers used by the southern pulp and paper mills is actually equivalent to a 24 million bale cotton crop. E.S.

GILMOUR, JOHN D. Realistic forest management for British Columbia. Western Pulp and Paper 2, no. 3: 12-14, 28-9; no. 4: 10, 29-31 (March, April, 1949).

Following a discussion of the most important recommendations of the Sloan Commission (*cf.* B.I.P.C. 19: 395) and the failure of the provincial government to carry them out, the author places the responsibility for the present condition of Canada's woodlands on government policies. He outlines the requirements of a successful large-scale sustained-yield management program especially adapted to conditions prevailing in British Columbia but, with minor changes, also suitable to other provinces. Temporary forest tenures must be made permanent if sustained yield is to be obtained, preferably through Crown Grants. Annual taxation must recognize that forest incomes are often deferred to some future time or may be periodic instead of annual; on the other hand, such expenses as fire protection and taxes are annual. Sustained yield units follow naturally after tenure, taxation, and public control have been regularized. The new form of tenure provided for by Management Licenses is criticized and its faults are discussed. The objective of sustained-yield practices is to provide an area which has the right proportion of all age classes from mature to very young trees; provisions should be made for a rate of annual cut which will bring this about. Taxation should be made on the net annual timber value to be received after deducting an amount for uninsurable risk and for protection from the value of the annual cut. Such a system is simple to apply, economical, and flexible enough through periodic revisions of assessments to meet changing conditions. Effort should be directed toward gradually increasing private ownership and private managership under government control. In conclusion, a discussion is given of government ownership of forests in Canada. R.R.

KRAMER, PAUL J. Plant physiology in forest research. Pulp Paper Mag. Can. 50, no. 4: 117-18, 120 (March, 1949); J. Forestry 46, no. 12: 918-21 (December, 1948).

The author explains and cites examples of many ways in which a knowledge of plant physiology can serve the forester in his effort to understand tree growth more completely. The function of plant physiologists in forestry research is to study and measure the internal processes and conditions of the trees, to observe the manner in which they are affected by changes in environmental factors, and to use this information in assisting foresters to direct their silvicultural operations more effectively. E.S.

ROYAL BANK OF CANADA. Our forests are worth preserving. Pulp Paper Mag. Can. 50, no. 4: 124, 126, 128, 130 (March, 1949).

The fact that overcutting does not merely destroy and exhaust timber, but also upsets the complex balance of vegetation, soil, and water control, is emphasized and explained. The need for intelligent public co-operation in official protection and for widespread forest education is stressed. E.S.

SILVERSIDES, C. R. The Indiana tree planter. Pulp Paper Mag. Can. 50, no. 4: 132 (March, 1949).

A brief description of the Indiana tree planter (sometimes known as the Den Uyl planter) is given; it is constructed from a general purpose Ferguson plow with necessary modifications. The machine is much lighter and cheaper than the other machines available. The planting crew may consist of two to four individuals, a three-man crew probably being the most economical. Under average conditions, 1200-1300 trees can be planted per hour. The quality of planting done by machines has been found distinctly higher than that done by hand labor. E.S.

THOMSON, C. C. Forest engineers encourage research. Pulp Paper Mag. Can. 50, no. 4: 121-2 (March, 1949).

Brief reference is made to current forest research in the Maritime Provinces and to new fundamental studies and applied silviculture planned to begin in 1949, including reproduction studies, stand development, direct seeding by airplane of burned-over areas, forest mensuration, etc. E.S.

FUNGI

CROSSLEY, T. LINSEY. Fungus infection in groundwood pulp. Pulp Paper Mag. Can. 50, no. 4: 85-6 (March, 1949).

An unusual case of fungus infection in Swedish Kamyr-pressed groundwood bales (55% airdry) is reported; the bales were bound with wire and the edges reinforced with strips of wood, largely birch. Much of the shipment was used soon after receipt without noticeable difficulty. The rest, which was stored in a dry dark warehouse for about six months, gave trouble by failure to disintegrate in the beaters, breaking up into small, curdy lumps. There was general fungus development on the sides of the bales, spreading over the tops and into the body. Three types of fungi were noted, black, pink, and brown, the last-named being the most prevalent, resembling the species *Cadophora obscura*. In the brown-stained areas of the bales, both the fibrous character and the capillarity of the pulp were apparently destroyed and the reinforcing strips of wood were considered the source of infection. It is suggested that wooden strips, especially birch, be avoided unless they are creosoted or treated in a similar manner. Pulp at 55% airdry must be considered too wet for long storage periods. Any pulp showing signs of infection should be used as quickly as possible. E.S.

HEUSER, EMIL, SHEMA, B. F., SHOCKLEY, WILLIAM, APPLING, J. W., and McCOY, JOHN F. The effect of lignin-destroying fungi upon the carbohydrate fraction of wood. Arch. Biochem. 21, no. 2: 343-50 (April, 1949).

After an incubation period of 20 months with *Polyporus paragamenus*, small blocks of aspenwood showed three color zones (tan, pink, and white) indicating attacks of varying intensity. Of these the white portion was the most heavily attacked. Whereas the original wood contained 17.5% lignin, 19.3% pentosans, and a D.P. of 1600, the white rotted portion contained 3.4% lignin, 8.4% pentosans and a D.P. of 444 (calculated on the basis of the acetone-soluble nitrate). The initial (calculated) cellulose value in the sound wood had risen from 60.68% to 85.32% in the rotted portion of the block. Cotton linters when inoculated with *P. paragamenus* showed little or no growth within nine months, although the D.P. dropped from 1325 to 1145. On the other hand aspen holocellulose, when similarly inoculated, showed growth and its D.P. dropped from 1270 to 800. It is evident that even sterilization seriously affects the D.P., because cotton linters whose original D.P. was 1450 dropped to 1325 and holocellulose, whose original D.P. was 1600, dropped to 1270. The presence of pentosan material seems to favor attack of the fungus on the cellulose constituent. However, the main attack of micro-organism is on the lignin and secondarily on the pentosans of the aspenwood. L.E.W.

FURFURAL

P. G. Furfural and papermaking. Papeterie 71, no. 2: 49, 51; no. 3: 89, 91 (February, March, 1949). [In French]

The author describes briefly the production and industrial importance of furfural and its possible recovery from prehydrolysis liquors in the manufacture of pulp. L.E.W.

GLYCERIN

LESSER, MILTON A. Glycerine's role in paper progress. Paper Ind. 30, no. 12: 1753-4 (March, 1949); *cf.* B.I.P.C. 17: 484, 698.

Recent applications of glycerin for plasticizing paper and as coating and impregnating agents and of synthetic alkyd resins for protective and decorative paper coatings are reviewed. 9 references. E.S.

GROUNDWOOD PULP

FOOTE, JAMES E. Groundwood pulp. Paper Mill News 72, no. 13: 39-40, 42, 84 (March 26, 1949).

After briefly listing the advantages (good printability and opacity, low cost and high yield, and suitability as filler fiber) and drawbacks (poor strength, color, and permanence) of groundwood pulp, the author describes the principle of the groundwood process and the equipment used. Brief mention is made of the variables involved and their control with regard to the raw material, moisture, stone surface, pressure, burring, amount of shower water, consistency of pulp during screening, size of screen perforations, etc. In conclusion, the possibilities of steaming and, more recently, of semichemical treatment of the logs prior to grinding are listed. E.S.

HOLLAND, W. W. The manufacture of groundwood for newsprint. Pulp Paper Mag. Can. 50, no. 4: 79-80 (March, 1949); Tappi 32, no. 5: 220-1 (May, 1949).

The various types of equipment used in the manufacture of groundwood

pulp for newsprint are discussed briefly under the headings: grinders, screening and thickening, refining, and pulpstone and burring. A knowledge of the wood used not only by species but also by density, moisture content, and age since cutting, and whether it will be ground separately by species or in a known mixture, allows the selection of the proper pulpstone to meet the requirements of the paper machines. Whatever species is used, its moisture content should not be below 40%; wood should be withdrawn from piles in rotation after an appropriate storage period and preferably not be ground when coming directly from the bush operation. In conclusion, the actual operating conditions of the Baie Comeau groundwood mill of the Quebec North Shore Paper Co. are outlined briefly. E.S.

VAN DEN AKKER, J. A., LEWIS, HARRY F., JONES, GARY W., and BUCHANAN, M. A. The nature of the color changes in groundwood. Tappi 32, no. 4: 187-92 (April, 1949); Pulp Paper Mag. Can. 50, no. 4: 87-92 (March, 1949).

The authors discuss the color of groundwood, the action of light on the color, and the nature of the color change resulting from sodium peroxide bleaching. The characteristic downward course of the "color curve" in the blue and violet regions of the spectrum, which accounts for the yellowness of groundwood, continues in the ultraviolet region with the curve gradually levelling off at a reflectivity of about 8% for wavelengths below 280 mμ. This behavior of the complete spectral reflectivity curve, coupled with the known spectral absorption of lignin, suggests that lignin is primarily responsible for the yellowish color of groundwood pulp. The change in color produced by light, which is most effectively measured in technical studies through brightness (papermakers'), is strongly nonlinear with time of exposure, the rate of change being very great for short exposure. The influence of the groundwood content in mixed furnishes, both on the color and color changes, is disproportionately large for a small groundwood content. The pH of the furnish is very important, the optimum value with regard to high brightness before and after fading being about 4.0. Oxygen plays only a minor role in the primary reactions of fading. Moisture content has a small but definite effect. Temperature alone causes only inappreciable darkening of color, but elevation of the temperature during exposure to light greatly increases the fading. The spectral sensitivity of groundwood indicates strongly that lignin is mainly responsible for the yellowing and darkening of color produced by light. The characteristic change of color is produced by ultraviolet light; light of wavelength longer than 480 mμ has a slight bleaching action, and the nature of fading produced by light of only moderately short wavelength is of a character different from that of ordinary fading by ultraviolet light; there are at least two photochemical reactions involved in the fading of groundwood. It seems probable that one of the effects of ultraviolet light is to disrupt certain linkages in the materials of the pulp which permits subsequent oxidation. Long exposures of groundwood to sunlight and the radiation from a Fade-Ometer arc produce changes in the measurable chemical characteristics of the pulp. These changes support the view that lignin is responsible for the fading effect, although the state of chemical knowledge is not sufficiently well advanced to permit definite conclusions on the relationship between the color changes and the chemical changes. Recent work on the effect of sodium peroxide bleaching on groundwood quite definitely indicates that the bleaching mainly affects the total lignin in the pulp; that the bleaching action on that portion of the lignin which is extractable (native lignin) is the same as that on the total lignin; and that, in spite of large consumption of the peroxide by the nonlignin components, virtually none of the observed bleaching action is attributable to the latter. 18 references. E.S.

WETMORE, R. T., and DUNPHY, L. W. Groundwood for newsprint; effect of grinder operation on printing quality. Tappi 32, no. 4: 150-4 (April, 1949); Pulp Paper Mag. Can. 50, no. 5: 81-5 (March, 1949).

Before 1940, the Anglo-Newfoundland Development Co. was making paper almost exclusively for the English market. Shipping difficulties during the war forced the transfer of a large part of the mill production to the American continent and the mill has been selling to the American market since that time. It soon became evident that the high-finish hard sheet being supplied to English customers was entirely unsuitable for American presses. Certain changes were required in paper-machine operation, but the most significant change was in the groundwood quality which was brought about by revising grinding practice, changing from natural to artificial stones, and by changes in the screening of the groundwood pulp. The nature of these changes and their effect on the newsprint paper is discussed. One of the most serious complaints from the American publishers was the poor printability, largely from lack of penetration of ink into the sheet, caused by the hard resistant surface. Extensive experimental work showed quite conclusively that the poor printability resulted from two factors, the actual physical hardness of the sheet, as shown by the low bulk and high smoothness, and an ink-resisting quality of the paper, which prevented ink penetration. The ink absorbency of the sheet was found to be related to the resin content of the groundwood and this factor, within limits, can be controlled by the grinding temperature. A grinder-pit temperature of 200° F. would give the most suitable resin content of 0.3% or less; however, under conditions existing at the mill, the pit temperature could not be raised above 172° F. The high degree of natural sizing also increased on aging. Sheets with good water absorbency when coming fresh off the machine, lost this absorbency if the rolls were stored at moderately high temperatures (over 70° F.). The change from natural sandstones to artificial stones allowed changes in freeness and pressure during grinding which resulted in a softer sheet with increased bulk and decreased smoothness. These characteristics were reflected in improved printability. In conclusion, the present possibilities for the control of groundwood quality are discussed. E.S.

GUAR

SWANSON, JOHN W. Methylation of guar polysaccharide. J. Am. Chem. Soc. 71, no. 4: 1510-11 (April, 1949).

Purified guar mannogalactan (I), containing 60% mannose and 37% glucose residues, was methylated, subjected to methanolysis, and the products fractionated at 0.006 mm. pressure (bath temperature 110-60°). About 39.1% of the product was methyl 2,3,4,6-tetramethylgalactoside [identified after hydrolysis as the anilide (II), melting at 193.5°] and accounting for 90% of the galactose units in (I). The two other main fractions—although not fully identified—appeared to be largely trimethyl and dimethyl mannosides, containing 52.1% and 43.5% methoxyl groups, respectively. (II) was also obtained from the hydrolysis products of the mixed glycosides. L.E.W.

GUMS AND RESINS

MANTELL, C. L. The water-soluble gums—their botany, sources and utilization. Econ. Botany 3, no. 1: 3-31 (January-March, 1949).

The article is an abstract of the author's book "The water-soluble gums," New York, Reinhold, 1947, and contains information on the important properties, commercial sources, and applications of a number of gums, seaweed colloids, and processed carbohydrates. E.S.

HISTORY

BOCKWITZ, HANS H. The art of papermaking and its cultural significance in the empire of the Aztecs and Mayas. Das Papier 3, no. 3/4: 53-5 (February, 1949); Papierwereld 3, no. 17: 358-60 (March 15, 1949). [In German and Dutch]

With particular reference to the book by Von Hagen "The Aztec and Maya papermakers," the author discusses the scant knowledge of the old Indian paper industry of Central America. E.S.

THE WALL PAPER MANUFACTURERS LTD., *Manchester, England.* The history of wallpaper. Paper & Print 22, no. 1: 29-30, 32, 34, 36, 39 (Spring, 1949).

Wallpaper originated with the book printers, especially wood engravers, of the Middle Ages. It was obviously a cheap substitute for costly cloth and leather hangings, panelling, and murals. Because good paper was scarce, printers often used whatever was on hand, sometimes printing designs on the backs of proclamations or works which were politically or religiously offensive. During the Tudor period black and white papers were very popular. Colors were used in papers made by the trunkmakers, upholsterers, and cabinetmakers, who further developed the art. Flock papers, made by scattering cloth shearing on a design previously outlined in adhesive, were produced by an independent group of craftsmen and were widely used in the eighteenth and nineteenth centuries. By the end of the 1600's wallpaper was rapidly becoming an article of common use in lower and middle class homes. Between 1740 and 1790 Chinese printed papers were in great demand. The Georgian period is the most interesting in the history of wallpaper and produced some of the most exquisite work for the homes of English nobility. Early in the nineteenth century French designers brought out panoramic papers which have never been equalled. The first successful wallpaper printing machine, an adaptation of equipment used with calico, began production about 1840 and resulted in inexpensive and often very unsuitable papers. The handwork of William Morris has historical importance, but its beauty had limited appeal; by the end of the nineteenth century the designs of Walter Crane, Lewis F. Day, and C. F. A. Voysey were meeting popular fancy. In conclusion, a discussion is given of some of the most important histories of wallpaper. Illustrations of some old designs are included. R.R.

INSTRUMENTATION

AKINS, G. F. Why automatic control? How automatic controllers work. Automatic principles are demonstrated with working model. Paper Ind. 30, no. 10: 1485-8; no. 11: 1618-23; no. 12: 1748-53 (January-March, 1949).

This is a lecture course in three parts, prepared for use in teaching the fundamentals of automatic control to new personnel. Although not specifically written for the paper industry, the articles deal with engineering and control problems common to many industrial processes. 23 illustrations and diagrams and 2 tables. E.S.

SNYDER, A. G., and SHOLL, H. A. Instrumentation—the crux of sulphite mill process control. Paper Mill News 72, no. 13: 44, 46, 48, 50 (March 26, 1949).

The authors describe the recommended instrumentation for a rotary sulfur burner, a Jenssen two-tower and pressure-acid system, a Chemipulp-KC direct cook-type digester, and a Chemipulp sulfite recovery system. E.S.

INTERIOR PACKING

CORCORAN, J. P. Principles & application of interior packaging. Fibre Containers 34, no. 3: 46, 48, 53-4 (March, 1949).

Nearly every article packaged requires an individual analysis of the necessary interior packing. The designing should not be done from a blueprint at the desk. It is necessary to handle each item and see how it is made to determine its weak points and those calling for special protection. The three factors requiring analysis are structural characteristics, surface protection needed, and dimensional limits, as set forth by carriers and container industries. Sometimes these limits will determine the type of packaging material to be used. The four general types of interior packing comprise the suspension, semisolid-cushioning, air-spacing and spring-cushioning, and anchoring methods. Each method and the most suitable applications are described, supplemented by diagrams. All methods are flexible in their use, but require intelligent application by trained personnel. Independent testing laboratories can be of invaluable assistance to the packaging engineer in eliminating questionable methods of packing. The increasing number and use of individual packing specifications will probably be the ultimate answer to the problem of proper interior packing. E.S.

LABORATORIES

BELL, OWEN. Laboratory layout. Paper Making and Paper Selling 67, no. 4: 25-8 (Winter, 1948-49).

The location of a laboratory is of primary importance and should be determined by its function—e.g., a process control laboratory should be convenient to the process and an analytical laboratory should be placed so that finished goods and raw materials on their way to stock rooms, etc., can be routed easily through the laboratory. A quiet location with north light and surroundings which will not interfere with the laboratory temperature, the availability of the necessary services, the design and location of drains, and the permeability and fireproofness of the floor should be considered. Allowances should be made for future expansion and for a subdivision for special apparatus which might be needed. Whenever possible, the layout is best left to the chemist who will use the space. A discussion is given of services such as gas, steam, electricity, and water, sinks, artificial lighting, a fume cupboard, glassware and similar equipment, physical apparatus, and chemical requirements. R.R.

LIGNIN

BRAUNS, F. E. The physical properties of lignin. Tappi 32, no. 4: 157-60 (April, 1949).

With the exception of its absorption spectra, all the physical properties of lignin reported in the literature have been studied on isolated lignins or lignin derivatives. The author presents a general review of the following properties: solubility, stability, melting point, heat of combustion, color, density, viscosity, molecular weight, sorption capacity, x-ray data, optical activity, and fluorescence. The ultraviolet and infrared absorption spectra are covered in the papers by Jones and Aulin-Erdtman. E.S.

BUCHANAN, M. A., BRAUNS, F. E., and LEAF, R. L., JR. Native lignin. II. Native aspen lignin. J. Am. Chem. Soc. 71, no. 4: 1297-9 (April, 1949); *cf.* B.I.P.C. 10: 10.

A native hardwood lignin has been isolated from aspenwood. After purification, the product contains 19.5% methoxyl. On treatment with 72% sulfuric acid, using the Klason procedure, the methoxyl content is increased to 20.4%.

A unit of native aspen lignin containing six methoxyl groups also contains six hydroxyl groups, one of which is phenolic in nature. The ultraviolet absorption spectrum of aspen lignin differs from that of softwood lignins in that no well-defined maximum is present. 10 footnotes. E.S.

JONES, EDWARD J. The infrared spectrum of native spruce lignin. Tappi 32, no. 4: 167-70 (April, 1949).

The infrared spectrum of the native spruce lignin of Brauns was determined in film form in Nujol dispersions from 3700 to 720 cm.$^{-1}$ Bands arising from hydroxyl and aromatic and aliphatic carbon-hydrogen groups are identified, and an aldehyde or keto carbonyl group in low proportion is established as the source of a weak band at 1663 cm.$^{-1}$ through comparison of the spectra of its methylation products. Tentative evidence indicating the aromatic and aliphatic carbon-oxygen source of other bands is given. Fractionation of native spruce lignin and comparison of the spectra of the fractions showed variation only in the strength of the carbonyl band. The spectra of five lignin preparations from spruce are compared and are shown to be basically similar; the spectrum of native aspen lignin was found to be quite different. Examination of a large number of so-called model lignin compounds failed to reveal any over-all spectral similarity to lignin. A group of carboyhydrate and tannin materials were examined and their spectra contrasted with the lignin spectrum. E.S.

PAULY, HERMANN. Separation of lignin components. II. Addition compounds with maleic anhydride. Chem. Ber. 81, no. 5: 392-9 (October, 1948). [In German] *cf.* B.I.P.C. 4: 295.

Native rye straw lignin A_1 and A_2, alkali rye straw lignin B_1 and B_2, acetic acid rye straw lignins C_1, C_2, and C_3, and acetic acid lignins C_1, C_2, and C_3 from spruce, pine, maple, basswood, and beech absorb iodine, indicating the presence of unsaturated linkages. This is further substantiated by the preparation of addition compounds of these lignins with maleic anhydride. The physical molecular weights are compared with the equivalent weights of the maleic anhydride addition products and it is found that the gymnosperm lignins with a methoxyl content of 15% are multiples of a lignin building stone with a molecular weight of about 180. This lignin building stone cannot be applied to the angiosperm lignins because of the presence of a syringyl group. To account for these reactions, the author assumes the presence of an isoconiferyl alcohol group with a reversed allyl alcohol group [$RCH(OH)CH:CH_2$] in lignin, by which he explains the formation of the addition compounds, of Hibbert's α-ethoxypropiovanillone and acetyl vanilloyl (*cf.* B.I.P.C. 10: 332; 11: 36), and of isohemipinic acid as found by Freudenberg (*cf.* B.I.P.C. 6: 465; 7: 263; and 9: 67). 29 footnotes. F.E.B.

RAFF, R. A. V., TOMLINSON, G. H., II, DAVIES, T. L., and WATSON, W. H. Oxidized lignin as a reinforcing agent for rubber. Rubber Age (N.Y.) 64, no. 5: 197-200 (November, 1948).

Experiments have shown that alkali lignins obtained from alkaline cooking processes by conventional methods acquire greater reinforcing power in GR-S rubber, when the lignin is oxidized before it is incorporated in a GR-S master batch. Such an oxidation may be carried out by bubbling air through an aqueous solution of lignin acid salt or lignin sodium salt or in other ways, such as purposely oxidizing the black liquor prior to or during its precipitation treatment or by oxidizing the lignin acid salt in dry powdered form in a current of hot air or oxygen. This may be carried out with or without catalysts or through the use of specific oxidizing agents. The oxidative treatment, preferably done in a lignin solution maintained at a pH of around 10

by the occasional addition of caustic, should be continued until the melting point of the modified lignin, after acid precipitation and drying, is at least 240° C. Concomitant with oxidation is a decrease in the methoxyl content and an increase in the viscosity of nonaqueous solutions and, for any given initial lignin, this property may be used, in addition to the melting point as an index of adequate oxidation. When these oxidized lignins are coprecipitated with GR-S latex, compounded, cured, and vulcanized, rubbers are obtained with tensile strengths actually comparable with the carbon black (EPC) reinforced product. With the addition of white pigments, a range of shades from gray to black is possible, and the addition of colored pigments allows the manufacture of most of the colored shades now in use. E.S.

TOMLINSON, G. H., II. Discussion on lignin. Tech. Assoc. Papers 31: 581-2; discussion: 582-3 (1948).

Following introductory comments on cellulose and lignin, the author briefly describes a process used at the Howard Smith Paper Mills for recovering lignin from black liquor by carbonating the liquor with flue gas, reducing the pH, and precipitating the lignin as lignin acid salts. By dissolving the first precipitate in hot water and forming an acid precipitate with sulfuric acid, a very finely dispersed product is obtained. A laminating paper can be made by adding lignin to the conventional paper-mill beater containing the fiber and running the paper on a Fourdrinier. When the finished product is subjected to heat and pressure, the lignin melts and flows around the fibers, encasing them in waterproof, structurally rigid "envelopes." A melamine resin is used to color the paper; the temperature is kept below 155° C. to maintain the desired color. Straight lignin-filled paper does not always laminate properly; therefore, 8-18% of a water-soluble phenolic resin is added in the size press of the paper machine to act as a plasticizer. R.R.

LUBRICATION AND LUBRICANTS

SCHULZE, WALTER. Directions for the use of lubricants in paper, board, and pulp mills. Das Papier 3, no. 3/4: 55-6 (February, 1949). [In German]

With reference to data on pulp, paper, and board mills published in the book by Michel and Dörrfeld "Wegweiser zur wirtschaftlichen Maschinenschmierung," in which the consumption of lubricants by different industries is discussed, the author emphasizes the need for keeping accurate records on all lubrication costs by the individual departments of the mill and describes means for avoiding waste and reducing consumption. E.S.

MACHINERY

ANON. Dynomizing with Dynopulper, Dynofiner and Dynochest. Paper Mill News 72, no. 13: 60, 62, 72 (March 26, 1949).

"Dynomizing" stands for separating, disintegrating, carding, combing, raking, hackling, and wetting of the fiber, and definitely not for hydrating, cutting, or slowing down the stock. Three types of Dyno machines are now in use, the Dynopulper for slushing wood pulp and waste paper, the Dynofiner for the continuous treatment of slushed stock, and the Dynochest for treating pulp, waste paper, or broke continuously or batchwise, while it is being circulated. Each of these machines has one or more Dynopellers, which suck the stock to their concave surface and expel it around their periphery at a high velocity. The concave face is studded with sharp particles of extreme hardness, giving it a lasting rough texture, the projections performing

the "dynomizing" work. Diagrams of Dynopulper and Dynofiner arrangements are included; different applications in board mills, tissue mills, for deinking, broke handling, and the improvement of groundwood pulp are described. The Dyno machines were originally developed by Kurt Wandel and are now being manufactured and further developed by the Rice Barton Research Corp. of Worcester, Pa. E.S.

KOREN, C. J. Technical developments in the chemical pulp industry. Norsk Skogind. 3, no. 2: 40-4 (February, 1949). [In Norwegian; English summary]

In reviewing the advances of 1948, the author states that the only significant new development of far-reaching consequence introduced during this period is the recovery process installed by Weyerhaeuser at their Longview, Wash., magnesium-base sulfite mill. Recent trends in barkers, chippers, the digester house, screens, bleaching, and the evaporation and combustion of sulfite waste liquor are discussed. Kamyr and De la Roza are proceeding with their work on continuous cooking. The first plant in Norway to use the semichemical process (Defibrator method) is being erected at Moss. Sund-Skönvik are manufacturing a new rotary vibrating screen (the Lindblad screen) and a new filter (the Lindblad filter). Both Rosenblad and Ramén have several new plants in operation or under construction for the evaporation and combustion of sulfite waste liquor. E.S.

MACHINERY—BEATERS

AMERICAN PAPER MACHINERY AND ENGINEERING WORKS, INC., *Glens Falls, N.Y.* Aquabrusher pulper. Paper Trade J. 128, no. 15: 39 (April 14, 1949).

The Aquabrusher pulper and beater is claimed to be a five-purpose improvement over the hollander beater, being designed for pulping and defibering; beating, brushing, and hydrating; cutting; centrifugal cleaning; and fine screening of baled waste papers and pulp simultaneously by the rapid rotation of beater impellers. A diagram is included illustrating the operation and flow of stock in the new equipment. E.S.

MACHINERY—CONSISTENCY REGULATORS

ANON. The Brammer consistency regulator. Paper Mill News 72, no. 14: 20, 22, 33 (April 2, 1949); *cf.* B.I.P.C. 17: 628-9.

A description of the instrument and its operation is given, similar to that of the previous reference. E.S.

MACHINERY—CONVERTING MACHINERY

BEASLEY, FRENCH & COMPANY, LTD., *Bedminster, Bristol, England.* A duplex bag-making machine. Paper Box and Bag Maker 107, no. 3: 92 (March, 1949).

By making two bags simultaneously, a new Belfanco unit produces plain or printed paper bags at speeds up to 4000 per minute (?). The machine is fed from one reel of paper, the single web being cut into two as it enters the unit. The paper web is threaded simply and quickly. If run as duplex equipment, it can produce bags up to 5½ inches wide; single bags up to 12½ inches wide are made at a maximum speed of 2000 per minute (?). If printed bags are required, the machine can be coupled with the company's standard 26-inch aniline printer. Illustrations are given. R.R.

KUNZ, M. The development and manufacture of round boxes. Neue deut. Papier-Ztg. 3, no. 5: 180-5 (March 15, 1949). [In German]

The author outlines the manufacture of round boxes and cylindrical containers first made by hand and then by machinery. Various types of semi- and fully automatic machinery for punching or drawing the tops and bottoms and for winding and pasting the tubular bodies are described and illustrated. E.S.

POLYFORM LIMITED, *Edgware, Middlesex, England.* A new souffle case machine. World's Paper Trade Rev. 131, no. 11: Suppl. 7 (March 17, 1949).

A brief illustrated description is given of a new souffle case machine, which takes up only 6 sq. ft. of floor space, is fully automatic, and blanks, pleats, forms, and double-turns the top lip, thereafter stacking the cups ready for immediate packing. Cups up to 7 ounces of fluid capacity can be made in a great variety of sizes, proportions, and rigidities from a wide range of paper or other materials. When a wax-impregnated paper is used, the need for subsequent wax dipping is obviated. E.S.

WESTBROOK, FRANCIS A. American paper converting equipment; some recent developments. World's Paper Trade Rev. 131, no. 11: Suppl. 4-6 (March 17, 1949).

Brief descriptions are given of the Sperry letterpress printer and rotary blanker, the model "K" wrapping machine manufactured by Stokes and Smith Co., Philadelphia, and the "Speedfeed" equipment for automatically registering boxes on glued wraps and feeding them to the wrapping machine. 3 illustrations. E.S.

MACHINERY—DRIVE, ELECTRIC

BALTZ, EBERHARD. The problem of a suitable wood grinder drive. Das Papier 3, no. 3/4: 45-8 (February, 1949). [In German]

The author emphasizes the advantages and merits of synchronous motors and advocates their wider use for driving wood grinders. L.E.W.

BRAUNS, O. Electronic regulation of sectional drives of paper machines. Svensk Papperstidn. 52, no. 4: 87-8 (Feb. 28, 1949). [In Swedish]

The author discusses the systems developed in the United States by the General Electric Co. and Westinghouse (*cf.* B.I.P.C. 19: 324). E.S.

MACHINERY—DRYERS

VAN KAMPEN, G. R. Better drying, at low cost. Paper Trade J. 128, no. 14: 26-7 (April 7, 1949).

The possibilities and advantages of modern radiant gas burners are outlined, particularly for improving the drier capacity of machines making a wide variety of papers, from fine bond to roofing felt and board. Coating operations offer another profitable use. The installation can usually be made in such a manner that no additional space is required and the cost is low. Burners may be added from time to time, so that a project can be carried out in steps rather than all at one time. The installation of one radiant gas burner was found to increase the drying capacity of a paper machine by more than the equivalent of one additional drier. E.S.

MACHINERY—ELECTRIC EQUIPMENT

LEE, A. H. Fractional-horsepower gearmotors . . . their classification and application. Gen. Elec. Rev. 52, no. 4: 20-3 (April, 1949).

A gearmotor is the combination of an electric motor and a gear reducer built and assembled to form an integral unit. Two principal types of gear reduction are used, the planetary and the worm gear, each of which is described briefly. The uses for gearmotors are both numerous and varied. A table of application classifications is included, listing a broad variety of uses and the class of gearmotor recommended for 8-hour and 24-hour service. Under "Paper mills" the following applications—all for 24-hour service—are given: agitators, bleachers, beaters and pulpers, calenders, conveyors, couch rolls, cylinders, driers, felt stretchers, jordans, presses, stock chests, suction rolls, and winders. All applications fall either into class II (steady load which does not exceed the rated load for 24-hour service, but with moderate shock loads permitted for 8-hour service) and class III (for moderate shock loads for a 24-hour service and heavier shock loads for 8-hour service). E.S.

MACHINERY—FELTS

WOODSIDE, L. M. The relation of felts to paper machine problems. Paper Trade J. 128, no. 13: 14-16 (March 31, 1949); Fibre Containers 34, no. 4: 36, 40, 45 (April, 1949); *cf.* B.I.P.C. 18: 760-1.

The author covers essentially the same points as discussed in the previous reference, although the two articles are not identical. E.S.

MACHINERY—PAPER MACHINE

ANON. Mando's No. 4 paper machine modernized. Paper Trade J. 128, no. 16: 23-4 (April 21, 1949); Paper Ind. 31, no. 1: 39 (April, 1949).

Brief reference is made to the rebuilding and modernization of the No. 4 paper machine of the International Falls mill of the Minnesota and Ontario Paper Co. The revamped machine is capable of producing in excess of 120 tons of both bleached and unbleached kraft and sulfite grades per day; its speed ranges from 200 to 1200 ft./min. The Fourdrinier wire has been increased from 70 to 100 feet and seven additional driers have been installed. The old steam-engine and rope-system drive have been replaced by the latest type sectional electric drive with electronic controls. E.S.

RILEY, F. R., and URQUHART, H. B. Powell River's new newsprint machine. Pulp Paper Mag. Can. 50, no. 4: 94-8 (March, 1949); *cf.* B.I.P.C. 19: 482.

The flow sequence and control equipment used on the new No. 8 paper machine at Powell River are described, including the stock flow before the headbox circuit, the actual headbox circuit, the broke circuit, and the white water circuit. Details of the individual machine sections are discussed. The experience on this machine to date is outlined, including benefits realized by the design and difficulties which have been encountered. Paper was run over the machine on September 1, and the machine was declared officially in operation on September 16. The speed for the week ending September 19, 1948, was 1270 ft./min. (72% efficiency) and has since then been gradually increased (Jan. 9, 1949) to 1477 ft./min. (92.3% efficiency). E.S.

MACHINERY—PASTING MACHINE

ANON. Vacuumizing heat sealer. Modern Packaging 22, no. 8: 168-9 (April, 1949).

An illustrated description is given of a recently developed small inexpensive semi-automatic heat sealer which incorporates a vacuum system as an integral part. The equipment has been operating successfully on Pliofilm packages of sauerkraut, which gave trouble when they occasionally burst because of the accumulation of gas given off by the product; when the air is removed, no gas forms. The machine vacuumizes and seals 30 bags a minute and can be equipped to withdraw air and replace it with any desired gas for those products which benefit from gas packing. Consumer reaction to the bag is very favorable. R.R.

MACHINERY—PIPING

DICKSON, R. A. Labor cost of installing piping. Chem. Eng. 56, no. 4: 97 (April, 1949).

With the aid of tabulated data and an equation, a method is described for finding the labor cost of handling, welding, and installing standard-weight steel pipe. The exposition and figures used are to be taken as a demonstration of a method, not as a table of labor costs to be put into general use in all plants. On account of the many variables among plants in the process industries, estimating divisions should determine their own basic quantities to be inserted into the formula. E.S.

MACHINERY—PRESSES

KLARFELT, K. The press section of the paper machine. Norsk Skogind. 3, no. 2: 34-9 (February, 1949). [In Norwegian; English summary]

Water removal on the paper machine by drying is about 11 times more expensive than by mechanical pressing. However, mechanical pressing is at present only practical up to approximately 40% ovendry; beyond this figure, the required pressures would increase to values which are not feasible on paper machines, so that heated driers must be employed for the final drying stages. The couch press is actually the first, and the smoothing press the last, part of the press section; between these two devices, two, three, or four presses (with or without suction) may be installed, depending on paper quality and speed of machine. Line pressure, rubber hardness, and felt quality are discussed. The following average values are given for ovendry consistency after the third press: newsprint, 33%; kraft paper, 34%; fine papers, 38%; and greaseproof, 26%. Developments and improvements in wet presses are described, with particular reference to suction, arrangement of rolls (Dual press, Simplex press, and stacked press), methods of loading, felt conditioning, doctors, roll covering, bearings, paper carriers, instrumentation, heating of paper web and felt, improved beating methods resulting in high strength and quality at low beating degrees, and improved mechanical and electrical drives. In conclusion, the author gives his idea of the paper machine and the paper mill of the future (year 2000). E.S.

MACHINERY—PRINTING MACHINE

ANON. Pressure-sensitive labels. Modern Packaging 22, no. 8: 131-3 (April, 1949).

A recently developed small machine which prints pressure-sensitive tape is expected to be of much assistance to users who want only a few pressure-sensitive labels at a time. The production speeds of the smaller model (accom-

modating rolls of tape up to 2 inches in width) is 115 imprints per minute; the larger machine, taking rolls up to 3 inches in width, can make 100 imprints per minute. With one arrangement a three-color effect can be obtained; with another, a roll of transparent tape can be laminated over the printed roll. The experiences of four companies are described to show the possibilities of pressure-sensitive tape for identification when it can be handled economically in the plant. R.R.

MACHINERY—ROLL STANDS

ANON. Handling shafts and cores. Shears 67, no. 675: 49 (March, 1949).

Illustrated descriptions are given of three shaftless stands which eliminate the need of shafts and the drudgery of loading the stands, coreing or mounting the rolls, and putting them in running position, and decrease maintenance expense. R.R.

MATERIALS HANDLING

ANON. Hammermill pulp warehouse a model of efficiency. Paper Trade J. 128, no. 17: 23-4 (April 28, 1949).

A brief illustrated description of the new warehouse of the Hammermill Paper Co., Erie, Pa., is given; it has a capacity of 5000 tons and is primarily used for the storage of Canadian and Swedish pulp in bales. The handling is done by two men, one on the floor and one in the crane cab, with a Cleveland tramrail screw grab with three floating heads. High piling without the need for aisles is thereby made possible; all space is utilized and safety improved. E.S.

ANON. Handling paper in rolls. Pulp Paper Mag. Can. 50, no. 4: 105 (March, 1949).

Useful directions for the cautious handling and storing (stacking) of paper in rolls are given. The many abuses to which the rolls are usually subjected are pointed out, as well as the careless treatment they receive after leaving the mill in perfectly round condition. The troubles caused to printers by eccentric rolls are listed. E.S.

ANON. Handling shafts and cores. Shears 67, no. 675: 48, 50 (March, 1949).

Of all disabling injuries reported to the National Safety Council by members of the paper industry, 5% occur in the handling of shafts and cores. Most cases are temporary total disabilities, such as fractures, and involve hand and foot injuries and back strain. The injuries occur chiefly while inserting shafts or removing them from cores, rolls, and reels, lifting or carrying shafts and cores, placing shafts on tables and stands, and storing cores on racks or piles or removing them. Council recommendations for safety practices are given. Aluminum shafts with a minimum diameter of three inches are suggested. A 78-inch shaft of this type weighs 88 pounds, a similarly sized tubular steel shaft 129.75 pounds, and a solid steel $2\frac{15}{16}$-inch shaft weighs about 255 pounds. R.R.

ANON. 25 ways to cut down warehouse costs. Paper Sales 9, no. 4: 23, 34, 36, 38 (April, 1949).

The suggestions given for decreasing warehouse costs include the following: good arrangement and accessibility of items, flexibility of set-up, ease of counting, regular uniform piles, minimum handling costs, visibility of labels, use of old before new stock, standardized equipment in the storage room, safety and fire precautions, cleanliness, wide aisles, etc. R.R.

HANFORD, EDGAR. Palletizing answers need for space. Am. Paper Merchant 46, no. 4: 23, 44-5 (April, 1949).

During and immediately following the war, merchandise shortages encouraged rather haphazard and inefficient warehousing of paper, which slowed down the handling of stock and filling of orders. During the past year, the changing situation has forced the proper consideration of the problem. The situation of the Johnston Paper Co., Cincinnati, Ohio, is described. Blueprints of the floor space were prepared and the locations of the various types of stock determined, storage bins were torn out, and pallets were substituted for skid bottoms and shelving. Three fork lift trucks are used for moving the stock. About 75% of previously wasted vertical space is being utilized under the new system, broken cases or cartons are stored on top of the stacks and used first in filling orders, the aisles are clear, inventory is simplified, and a greater amount of work is being handled by the same number of men. R.R.

MICROSCOPY

ANALYTICAL CHEMISTRY. Developments in applications of chemical microscopy. Anal. Chem. 21, no. 4: 430-85 (April, 1949).

This is a symposium of eight papers, which were presented before the Division of Analytical and Micro Chemistry at the 114th meeting of the American Chemical Society in St. Louis. The authors and titles of the papers are: Mason, Clyde W. The microscopist in the technical organization, p. 430-2; Foster, L. V. Microscope optics—14 references, p. 432-6; McCrone, W. C. Application of fusion methods in chemical microscopy, p. 436-41; Royer, George L. Chemical microscopy in dyeing and finishing—12 references, p. 442-7; Mitchell, John, Jr. Microscopic identification of organic compounds—33 references, p. 448-61; Rochow, T. G., and Rowe, F. G. Resinography of some consolidated separate resins (*cf.* B.I.P.C. 18: 547), p. 461-6; Loveland, R. P. Color photomicrography in the laboratory, p. 467-75; Turkevich, John, and Hillier, James. Electron microscopy of colloidal systems—173 references, p. 475-85. E.S.

MILL MANAGEMENT

COOPER, ALFRED M. When you lead a conference. Paper Ind. 30, no. 12: 1745-7 (March, 1949).

The author gives useful suggestions (do's and don't's) for the successful technique of conference leadership, whether the conference is called to get the opinions of the group members and from them evolve a plan of action, or whether the executive has a plan of action in mind and wants to sell his idea to the group through open discussion. E.S.

ESTABROOK, THOMAS W. Advanced or preventive maintenance. Paper Ind. 30, no. 12: 1747, 1755-6 (March, 1949).

The majority of mills in the United States are equipped with paper and pulp machinery which is more than 10 years old and which is now being operated at speeds and pressures far greater than those for which it was originally designed, with consequent increase in strain and the resulting tendency toward breakdown. With the increased unit cost of all operations, it is of great importance to survey all means to reduce production losses caused by insufficient maintenance in the continuous flow of processes characteristic of the industry. This not only involves the mechanical trades and their leadership, but also other departments, including mechanical research and engineering, inspection, statistics, purchasing, and storekeeping. By means of practical examples, the far-reaching consequences of an apparently insignificant neglect and the part played by each department are illustrated. E.S.

MOLDED PULP ARTICLES

PULP REPRODUCTION COMPANY, *Milwaukee, Wis.* New protective packaging for small, large products. Packaging Parade 17, no. 195: 64 (April, 1949); Fibre Containers 34, no. 5: 51 (May, 1949).

A new molded wood-pulp shock cushion is available in round, square, oval, or rectangular shapes. The cushions are placed in the corners of the crate or carton, under the product requiring protection, and around the top corners. R.R.

MOLECULAR WEIGHT

KINELL, PER-OLOF. Molecular weight determinations. Svensk Kem. Tid. 61, no. 2: 19-48 (February, 1949). [In English]

The author summarizes in this review the current status of published molecular weight methods for high polymers. Particular emphasis is given to the ultracentrifuge and diffusion methods. Both gravimetric and volumetric osmometry are described. Only limited treatment of light scattering and dilute-solution viscosity is given. 88 references to current literature, the majority of which are to U.S. periodicals. A.M.B.

NITRIC ACID PROCESS

DELCROIX, P. Nitric acid processes used in pulp manufacture. Bull. assoc. tech. ind. papetière 3, no. 2: 32-4; discussion, 35-7 (March, 1949). [In French]

Surgical cotton (98.7% α-cellulose, copper number 0.01) was subjected to the following treatments: (I) 40% nitric acid at 14° C. for 3-12 hours; (II) 5% nitric acid at 100° C. for two hours; and (III) 20% nitric acid at 80° C. for one hour. In each case, the nitric acid treatment was followed by soaking four hours in 1% aqueous sodium hydroxide at 20° C. In the case of (I), neither α-cellulose nor copper number changed appreciably, the minimum α-content being 96.8% and the maximum copper number 0.1. With (II), the α-cellulose content dropped to 91.5% and the copper number rose to 2.1; and with (III), the α-cellulose content dropped to 87.2% and the copper number rose to 2.79. When applied to wheat straw (I) followed by a hypochlorite bleach gave the highest yields (51%) with a cellulose content of 83% and the strongest pulp. Methods (II) and (III) gave yields of 39 and 44%, respectively, and much weaker pulps. Commercial straw pulps (both French and English) contained less α-cellulose than that present in any of the nitric acid pulps, and were far weaker than that prepared by (I). The low temperatures appear essential. When (I) was applied to straw at 35° C. (instead of 14°), the yield dropped to 45% and the strength properties decreased. Methods of maintaining the low temperatures and nitric acid recovery are discussed. L.E.W.

NITROGEN DIOXIDE

PFEIFFER, OSKAR, and KRÜGER, DEODATA. Contribution to the oxidation of cellulose with nitrogen dioxide. Angew. Chem., Beiheft no. 55: 85 p. (1949); abstract: Angew. Chem. 59 A, no. 9: 276-7 (September, 1947). [In German]

The investigations of Kenyon and co-workers (*cf.* B.I.P.C. 12: 175-6) and of Maurer and Reiff (*cf.* B.I.P.C. 14: 161-2) on the oxidation of cellulose fiber with nitrogen dioxide have been extended to regenerated cellulose (staple fiber) with particular regard to the effect on the textile properties. The oxidized cellulose is characterized as follows: (1) the presence of carboxyl groups, which evolve carbon dioxide when the product is heated

with an acid; (2) high alkali solubility; (3) a characteristic change in the swelling value which, on mild oxidation, is reduced about 50% but with higher carboxyl content, on the other hand, increases to about 200% of the original value; (4) an increase in the moisture resistance; (5) poorer fiber properties, especially embrittlement; (6) higher copper number; and (7) lower average D.P. In addition to the formation of carboxyl groups, a hydrolytic degradation of the cellulose chains takes place, which is attributed to the action of nitric acid formed from the gaseous reagent and the water contained in the cellulose. Although, as mentioned by Kenyon, the highly oxidized products preserve their fibrous structure, they have no textile importance because of the extreme chemical degradation and high alkali solubility. According to x-ray diagrams, the crystalline bonds are destroyed by the time the degree of carboxylation reaches about 30%. The study of salt formation (D. Krüger) shows a conformity to the law of mass action and also a Donnan equilibrium effect. The result of the treatment with metallic salts is combined with the fiber degradation and, in strong sodium or calcium acetate solutions, the solubility of higher carboxyl content preparations is considerable. The swelling value of the oxidized cellulose with free carboxyl groups is increased by reaction with sodium or calcium salts, but it is decreased with barium, silver, lead, copper, and aluminum salts. The wettability is increased by salt formation with sodium, but it is considerably diminished with aluminum or other heavy metal salt solutions. The possibility of obtaining fibers by nitrogen dioxide oxidation with better water stability is associated with the problem of carrying out the oxidation without damaging the essential fiber properties. M.A.H.

PAPER—COATED

PENN, W. S. Vinyl paste technology. Brit. Packer 11, no. 4: 23 (April, 1949).

In an attempt to lower the cost of producing polyvinyl chloride film for packaging, a vinyl paste has been developed which is spread over a surface and heated without pressure; the result is the same as a package made of a calendered sheet. The vinyl paste has a 100% solids content and, therefore, has no solvent to be removed. Coatings 0.02 inch or more thick can be made at one pass and high temperatures can be safely used on the film immediately. Viscosities of 500-10,000 centipoises are obtained. Such a paste will give a Shore A durometer hardness of 83-85 after fusing. Manufacturers can easily mix their own pastes by using the correct plasticizer to obtain the desired physical properties and flow characteristics. An ordinary spreading machine may be employed and a heating tunnel about 10 feet long with a temperature of 350-375° is satisfactory. At such temperatures the plastic becomes quite fluid and may easily be embossed. Batches of the material can be heated in ovens. Any object so coated must be unaffected by the heat and the coating must peel off easily. One of the most promising applications is in coating small metal parts; packaging materials are also readily covered. R.R.

SIMPSON, J. R. The Champion process for machine coating. Paper Trade J. 128, no. 13: 11-13 (March 31, 1949).

The equipment and procedures employed by the Champion patented machine-coating process are described, including the coating-mix preparation and the coaters. An excess of coating is applied to the surface of the sheet by means of a roll revolving in a trough of coating mix, the excess being removed with a specially constructed wiping blade. For efficient operation, the sheet must leave the blade at the proper angle and with sufficient tension. After coating, the sheet must be passed around at least one drier with the dry side against the hot surface and the newly coated side out, so that the coating

will be sufficiently dry to prevent sticking to the hot drier surface when the coating comes in contact with it on succeeding driers. An automatic electrical break detector installed ahead of each coater stops the coater roll when a break occurs. Different methods of bypassing the coaters for paper and board are briefly mentioned. There are now 26 Champion coater installations in operation in different paper and board mills here and abroad, with 14 others awaiting delivery of equipment. E.S.

STILBERT, E. K. Development of latex as a paper coating adhesive. Paper Trade J. 128, no. 14: 27-8 (April 7, 1949).

This article contains essentially the same information as given in the following reference. E.S.

STILBERT, E. K. New synthetic latices as a pigment binder in clay coated papers. Tech. Assoc. Papers 31: 585-6 (1948).

Dow Latex 512 is a styrene-butadiene powder with base materials of synthetic rubber components. The latex itself is a dispersion of 45% solid particles in water, which is deposited as a soft film. Care must be taken to prevent the skin, which results from exposure to the air, from getting into the paper coating and spoiling the color quality. The principal use in the paper industry is for printing and decorative paper and as a wallpaper adhesive binder. It is also being applied as a binder for cotton fibers and for felts and fabrics, for sizing untwisted thread, and as a free film material modified with clay for use as a base in the manufacture of oilcloth. Three adhesives are generally used in the printing paper field: starch, casein, and soya. In addition to being somewhat water-resistant, latex improves the gloss in high-gloss printing, makes a denser coating which resists ink absorption, makes a good label stock because it holds up well and can be soaked, eliminates the problem of curl, and makes a more stable paper for the pressroom. R.R.

STRUTHERS WELLS CORPORATION, *Warren, Pa.* Efficient and economical method of preparing high quality paper coatings. Paper Ind. 30, no. 12: 1732 (March, 1949).

Supplemented by an illustration and a flowsheet, the mode of operation of the Radial Propeller agitator is described for the efficient processing of coating slurries containing from 40 to 70% solids. E.S.

PAPER—CURLING

KOTTE, HANS. The curling of machine-glazed papers. Textil-Rundschau 4, no. 2: 53-5 (February, 1949). [In German]

The author discusses the reasons for curling of machine-glazed papers, means for minimizing these tendencies during manufacture by the correct selection of pulp and operating procedures, and means at the disposal of the converter for overcoming difficulties in the handling and use of such paper. E.S.

PAPER—MERCHANDISING

MCSWEENEY, EDWARD. Future of selling agent. Pulp & Paper 23, no. 4: 51-2 (April, 1949).

Any mill in business to make a profit has a definite need for a selling agent. He should become a management advisor and marketing counsel to the firms he represents and create good "sales personalities" for them. There are four phases to his operation: preselling, selling, service and follow-up

practices, and building prestige. Preselling is important because it is only by appraisal that a mill can determine what is needed for financing, market research, plant and equipment, product research, surveys and reports, etc. To give good service, the selling agent must keep in touch with new developments in communications and merchandising, new sales ideas, promotional efforts, the findings of economists and statisticians, etc. Giving service and carrying out follow-up practices to get and keep satisfied customers means aggressive and inspired work which has been largely neglected by the industry. Building prestige is an inevitable by-product of all the other factors.
R.R.

PAPER AND PULP INDUSTRY

AMERICAN PAPER AND PULP ASSOCIATION. Period of readjustment. Paper Mill News 72, no. 17: 49 (April 23, 1949).

Two graphs are shown and their significance is discussed; chart I shows the relationship of price index changes during 1948 for farm products, all commodities, and manufactured products, and chart II the changes in pulp, paper, and board data (capacity, production, and new supply) for 1939, 1944, and 1948. E.S.

ANON. Chronological review. Paper Mill News 72, no. 17: 55-6, 59-60, 62, 64, 66, 68 (April 23, 1949); *cf.* B.I.P.C. 18: 687.

Outstanding events in the industry from April, 1948, to April, 1949, are recorded. E.S.

ANON. Survey of new capacity—1948, 1949, 1950. Paper Mill News 72, no. 17: 70, 72 (April 23, 1949).

Capacity increases (new and rebuilt machines) are tabulated for the main grades of paper and board. The data were prepared with the help of the American Paper and Pulp Association, the Writing Paper Manufacturers' Association, and the National Paperboard Association. Taking the total capacity of paper and board at the end of 1948 as 23,240,320 tons, the corresponding figures for the end of 1949 and 1950 are estimated at 24,325,260 and 24,617,280 tons. Experience indicates that future plans are subjected to change and all the planned new capacity will seldom result in installation.
E.S.

NEUBRECH, W. LEROY. Review of industry marks peak in production. Paper Mill News 72, no. 17: 36-40, 42, 44-6, 48, 68 (April 23, 1949); *cf.* B.I.P.C. 18: 687; 19: 565.

The complete text, including tables and graphs, of the Industry Report: Pulp, Paper and Board, for February, 1949 (annual review issue) by the U. S. Department of Commerce, Office of Domestic Commerce, is presented.
E.S.

STEVENSON, LOUIS T. The interpretation of the basic demand charts. Southern Pulp Paper Manuf. 12, no. 4: 52 (April, 1949).

The "demand at the point of consumption" may be for consumption, for increasing inventories, for export, or for speculation. Of these four, basic demand is that for consumption. It is the steadier and more fundamental demand, whereas the other types are irregular and more or less fugitive. During the last two years, basic demand has been augmented by rebuilding of customers' inventories, an increased export demand, and a varying amount of speculation in paper, the first of these three factors absorbing the bulk of

excess production over basic demand since early 1947. It is the disappearance of this demand for inventory replenishment in some grades which has caused a momentary slackening of orders in these grades. In the meantime, basic demand is running at the level of 80% above prewar. In conclusion, the author explains the functions of inventories as margins of safety against closing down operations. E.S.

PAPER AND PULP INDUSTRY—TRANSPORTATION

HASTINGS, EDWIN C. Classify your freight properly. Am. Paper Merchant 46, no. 4: 27-8 (April, 1949).

Because many shippers do not certify on the shipping order and bill of lading the actual value of the shipment, they may be charged higher freight rates than are necessary. Some carriers feel that they are not obligated to educate shippers in correct descriptions to secure lower rates. The needless expense has been found to be the cause of losses in sales. An example is given of shipping carbon paper, for which the value must be specified as above or below 30 cents per pound. R.R.

PAPER SPECIALTIES

ANON. Greaseproof parchment bag for pie mix. Modern Packaging 22, no. 8: 167 (April, 1949).

A vegetable parchment is now being used for packaging pie mix to replace the nongreaseproof paper bags formerly used which became brittle along the folds as the oil and grease were absorbed. The vegetable parchment is sufficiently plastic to remain strong at the folds of the bag, thereby giving added protection from shock. Since the bags are coated across the top with a thermoplastic adhesive, they can be sealed on equipment previously used. An outer carton is also employed. R.R.

ANON. Heat-sealing bags—increased sales opportunities. Paper Sales 9, no. 4: 20-1 (April, 1949).

Heat-sealing bags are made similar to conventional flat or serrate-edge merchandise bags with a strip of heat-sealing material across the opening for quick complete sealing. The hot melt must have a melting point low enough for convenient use at temperatures not dangerously high and a setting point sufficiently high that summer heat will not soften it. The bags may be made of moisture-vapor-resistant materials. The use of such containers has increased rapidly and they are now employed by both the textile and food industries. Heat-sealable kraft bags, some with transparent film windows, are becoming popular for prepackaging fresh fruits and vegetables; heat-sealable aluminum foil and foil-laminate bags are ideal for many uses. R.R.

ANON. Hospitals are a growing paper market. Paper Sales 9, no. 4: 17, 44, 46 (April, 1949).

A discussion is given of the paper products replacing articles which are commonly used in hospitals and which require frequent washing and sterilizing, such as towels, napkins, handkerchiefs, diapers, aprons, table cloths, tray covers, and dishes. The change to paper articles is an economical measure, minimizes labor shortage problems, removes many potential sanitary hazards, and eliminates much of the noise of dish washing. R.R.

ANON. Paper coffee pouch. Modern Packaging 22, no. 8: 166-7 (April, 1949).

A heat-sealing paper has been developed which is protective and has sufficient strength and pliability for use on automatic pouch-making equipment. The advantages given are economy, product protection, attractiveness, and convenience. The stock is a supercalendered bleached kraft processed on a glassine paper machine and impregnated with plasticizing agents. The coating is a nitrocellulose lacquer film which makes the stock heat sealable and protective against moisture. Other types of coatings can be used to impart various qualities to the paper. The product can be laminated to itself to produce a web with a very low water-vapor transmission. The pouches are used for coffee, sugar, salt, spices, dry yeast, pharmaceuticals, candy, soap powders, etc. R.R.

ANON. The production of relief papers. Paper & Print 22, no. 1: 84-6 (Spring, 1949).

"Anaglypta" papers hold relief better than those embossed by other means because the embossing is done during paper manufacture while the paper is still wet. The equipment used is much like an ordinary paper machine, with the inclusion of the embossing unit and the substitution of a heated chamber for the drying rolls. The paper, made from jute and sulfite wood pulp, is used as a flexible jointing in prefabricated houses and as soundproof panels. "Lincrusta-Walton" wall decorations are made by depositing a plastic onto a body paper. Realistic wood effects and finishes with gold and silver bronzes from cellulose paints are available. Both products are manufactured by the Relief Decorations Branch of The Wall Paper Manufacturers Ltd. R.R.

ANON. Yes, we have trademarked bananas. Packaging Parade 17, no. 195: 52-3 (April, 1949).

The latest innovation in banana merchandising is the banding of consumer-size units. The method serves to distinguish carefully ripened fruit from that of poor quality, speeds up retail sales, and decreases damage from customer handling and shrinkage losses. "Chiquita" bands, used to identify United Fruit Co. bananas, are made from 300 P.T. cellophane printed in four colors and applied by means of a sheet gluer or from 60-pound white gummed kraft stock printed in three colors. The fruit should be well cushioned against scarring and bruising; padded paper blankets, shredded paper, grass mats, and sponge rubber can be used for this purpose. R.R.

DUVAL, CLÉMENT. How a filter paper burns. Anal. Chim. Acta 2: 92-3 (1948); C.A. 43, no. 1: 60 (Jan. 10, 1949). [In French; abstract in English. Abstract only available]

The loss in weight during burning of so-called "ashless filter paper" was studied with the Chevenard thermobalance. Water is lost rapidly up to 410° C., where the paper still maintains its structure and consists almost entirely of carbon. The latter burns completely at 410° to 675° (rapidly up to 610°, and more slowly thereafter). At 675°, the residue is perfectly white. Results are reproducible, independent of pore size, and the same as for absorbent cotton. E.S.

OSWIN, C. R. Protective wrappings. Chemistry & Industry [68] no. 12: 183-7 (March 19, 1949).

The author discusses flexible wrapping materials which afford protection to their contents for only relatively short periods, including papers (wet- and dry-waxed papers and glassines, and those with a varnish, melt, calendered, or other continuous coating), plain and moistureproof cellophane, and cellu-

lose acetate, acetate butyrate, rubber hydrochloride, polyethylene, polyvinyl chloride-acetate, and vinylidene chloride copolymer films, as well as metallic foils (usually aluminum), and laminations of one or more of the above classes. Data on tensile strength; elongation at break; elastic modulus; tear resistance; bursting strength; resistance to water vapor, oxygen, carbon dioxide, and odors; and seal (adhesive and heat) strength of these materials are tabulated and the individual tests are described briefly. The figures quoted for each test show what help can be obtained from testing methods when choosing a wrapping for a particular purpose. Wrappings must be selected for each application and the choice may vary according to the size of the package, its destination and climatic conditions, method of application, cost, etc. The gradings of wrappers obtained by tests carried out on plain sheets do not necessarily agree with the behavior when the same wrapping material is applied to an article and subjected to creasing, bending, or scratching, exposure to light or oxygen, etc. The advances made in recent years in producing films of higher water-vapor resistance have not been paralleled by advances in the technique of sealing and it is in this direction that the improvements in package performance are to be sought. Tests thus far show that heat sealing is somewhat better than adhesive sealing for retaining protection. Practical tests on complete packages are best supplemented by theoretical studies to find the reasons for any unsatisfactory results. 18 references. E.S.

PAPER MAKING AND PAPER SELLING. Hand-made papers and their production at the Eynsford Paper Mill, Kent. Paper Making and Paper Selling 67, no. 4: 22-4 (Winter, 1948-49); *cf.* B.I.P.C. 19: 568.

An illustrated description is given of handmade paper manufacture as done at the Eynsford Paper Mill, Kent. The preparation of the high grade rags usually employed, boiling with steam and chemicals, breaking, bleaching, beating, and especially sheet formation, drying, and finishing are described. Handmade paper has been a product of Kent since 1648. R.R.

PAPER SALES. Take a closer look at your paper napkin sales. Paper Sales 9, no. 4: 14-16, 28, 30 (April, 1949).

The use of dispensers and good quality paper napkins with greater strength and serviceability than the ordinary kind will decrease the number of linen napkins used, make a good impression on the customer, and give greater satisfaction. The new facial-tissue napkins should favorably impress almost any restaurant owner who has been using linen. Economy, convenience, sanitation, and the growing acceptance of the paper article are important selling points. In conclusion questions and answers are given to provide information on the manufacture, stock, embossing, types, and standard weights and sizes of paper napkins. R.R.

PATENTS

WEST, CLARENCE J. United States patents on papermaking; fourth quarter, 1948. Tappi 32, no. 4: 65A-70 (April, 1949); *cf.* B.I.P.C. 19: 497.

A list of U.S. patents on papermaking for the fourth quarter of 1948 is presented. E.S.

PHOTO-ELECTRIC CELL

ANON. Lateral control of paper webs by photo-cells. Paper Box Bag Maker 107, no. 3: 87 (March, 1949).

An illustrated description is given of equipment made by the Electrical Equipment Co. (Leicester), Ltd., utilizing General Electric photocells, which will counteract the side-to-side movement of a paper web passing through converting machinery. The photocells, actuated by light falling on them according to the lateral position of the web passing through the control head, control two solenoids which, when necessary, move an idler roller sideways under the web and gradually edge it in the desired direction. Accuracy of control to within a few thousandths of an inch can be obtained; correction starts at once when there is any deviation from normal. A further adaptation of this principle is guiding the web from a colored line, such as is often used in printing paper. R.R.

PHYSICAL TESTING—FASTNESS TO LIGHT

SELLING, H. J. Tests on the fastness to light of dyed fabrics and papers. Mededeeling van het Vezelinstituut T.N.O. no. 76: 24 p. [1945] [In Dutch; English summary]

After reviewing the standards and methods for testing the fastness to light of dyed fabrics and papers used in Germany, Great Britain, the United States, and France, the author discusses the factors which influence the fading of dyestuffs and the requirements which an apparatus for testing the fastness to light must meet. In conclusion, the results of comparative fading tests are described, which were obtained in sunlight and with the modified Fugitometer of the Vezelinstituut T.N.O. 8 tables, 14 diagrams, and 17 references. E.S.

PHYSICAL TESTING—INK

CARMAN, EVERETT. The ink dryograph. Am. Ink Maker 27, no. 4: 30-1, 59 (April, 1949).

The ink dryograph measures the drying of printing inks on paper. It tests the drying of 24 prints simultaneously and tests each print every 30 minutes for 26 hours. The test is carried out by covering the inked test strip with white paper and pressing a stylus with constant pressure against the covering sheet; while the ink is wet, the stylus produces a line on the back of the covering sheet. An illustrated description is given of the apparatus and its operation. It has been found that the most satisfactory covering sheet is a 20-pound 25% rag bond. Acceptable tests have been made with black linseed inks on bond, coated, and machine-coated paper. R.R.

PHYSICAL TESTING—PAPER

SALISBURY, G. D. Paper control laboratory. Modern Packaging 22, no. 8: 138-40 (April, 1949).

Because of the great variety of papers, a sound knowledge of their properties is essential to the correct selection of the one that will do the best for the packaging job under consideration. A description is given of the activities of the new Paper Control Laboratory of Bemis Bro. Bag Co., St. Louis. The temperature of the testing room is controlled and the relative humidity held at 50%. Before being tested, all paper is kept in the room until it reaches equilibrium with the temperature and humidity. Tests made on the paper include those for thickness, basis weight, fiber study, tensile and bursting strength, grease penetration, pH, softness, smoothness, porosity, bonding strength between coatings and base stock, gloss, printing qualities, etc. After those tests which are considered necessary have been made, the paper samples are made up into bags and put through performance tests. Illustrations are included. R.R.

PHYSICAL TESTING—PAPER—BASIS WEIGHT

VERBAND SCHWEIZERISCHER PAPIER- UND PAPIERSTOFF-FABRIKANTEN. *Technische Kommission,* and EIDG. MATERIALPRÜFUNGS- UND VERSUCHSANSTALT, *Hauptabteilung C, St. Gallen.* Determination of the square-meter weight and of the volumetric weight. Textil-Rundschau 4, no. 2: 67 (February, 1949). [In German]

The text of the Swiss tentative standard VSPPF-EMPA C 1022 is given. E.S.

PHYSICAL TESTING—PAPER—BURSTING STRENGTH

SULSER, HEINRICH. A new strength tester for woven and knitted fabrics, paper, etc. Textil-Rundschau 4, no. 2: 49-53 (February, 1949). [In German]

The principles and advantages of a new ball bursting-strength tester are described, in which the material to be tested is placed in an annular clamp and the pressure causing it to bulge and burst is transmitted by a ball fixed to a piston. The friction between the forward-moving ball and test specimen has a decided influence upon the test results; this factor can be eliminated by revolving the piston while pushing it forward. The construction and operation of the instrument are described, supplemented by a diagram, illustration, and tabulated data giving test results. Although originally developed for the textile industry, the instrument can also be applied to the testing of paper, foils, thin leather, etc. E.S.

PHYSICAL TESTING—PAPER—FOLDING ENDURANCE

VERBAND SCHWEIZERISCHER PAPIER- UND PAPIERSTOFF-FABRIKANTEN. *Technische Kommission,* and EIDG. MATERIALPRÜFUNGS- UND VERSUCHSANSTALT, *Hauptabteilung C, St. Gallen.* Determination of the folding endurance of paper. Textile-Rundschau 4, no. 3: 95 (March, 1949). [In German]

The text of the Swiss tentative standard VSPPF-EMPA C 1211 is given; the Schopper, MIT, Lhomme et Argy, or Köhler-Molin folding tester may be used. E.S.

PHYSICAL TESTING—PAPER—GLOSS

HARRISON, V. G. W. Gloss measurement of papers: a comparative study. J. Sci. Instruments 26, no. 3: 84-90 (March, 1949).

The performance of the Bausch and Lomb and Sheen glossmeters has been examined. Comparison of gradings of nine printing papers according to visual and instrumental means showed that, despite high correlation between them, there were nevertheless important discrepancies not attributable to sampling, and instrumental or personal errors. The effect of the angles of incidence and of viewing on grading was investigated; best results were noted at 45°, and the discrepancies became more pronounced at greater angles. Gradings of the same papers according to the Jones, Askania, Goerz, Ostwald, and Klughardt methods were examined; all were found unsatisfactory. It is concluded that, for the limited range of papers tested, the most satisfactory grading is given by measurements of the intensity of light received when angles of incidence and viewing are 45°. 11 references. E.S.

PHYSICAL TESTING—PAPER—MOISTURE

BRAUCKHOFF, HELMUT. Rapid method for determining moisture

in paper. Das Papier 3, no. 3/4: 56-7 (February, 1949). [In German]

A brief description is given of the sword hygrometer made by Wilhelm Lambrecht, Göttingen, for determining moisture in paper and bales. The hair cord is enclosed in the perforated shaft of the instrument and the correct moisture content can usually be read off within 10 minutes. When special measuring elements are used in place of the hair cord in sword hygrometers, the moisture can be read off in two to three minutes (type Velox, made by the same firm). L.E.W.

PHYSICAL TESTING—PULP

EGMOND, H. J., and VAN NEDERVEEN, G. A study of the various laboratory instruments for pulp and paper testing. Mededeeling van het Vezelinstituut T.N.O. no. 81: 23 p. [1947] [In Dutch; English summary]

The standard pulp evaluation method used in Great Britain and its American modification, and those employed in Sweden, Germany, and Finland are described; their advantages and drawbacks are discussed, supplemented by illustrations and tabulated data. 29 references. E.S.

VAN NEDERVEEN, G. Standard equipment for pulp evaluation. Papierwereld 1, no. 22: 340-1 (June 1, 1947); V.I.-Pamphlet no. 4: 6 p. [1947] [In Dutch; second reference with English summary] *cf.* abstract above.

The different methods of pulp evaluation in Germany, Sweden, Finland, Great Britain, and the United States are described. E.S.

PLASTICS—PAPER-BASE

ANON. Laminates at sea. Brit. Plastics 21, no. 238: 139-45 (March, 1949).

Reference is made to the widespread use of laminated plastics in British ships for the surfacing of cabins, bathrooms, table tops, mural decorations, bar counters, etc., the three most commonly employed materials being Holoplast, Formica, and Warerite. Illustrations are included. E.S.

PRINTING AND PRINTER'S INK

ANON. What's this about a new gravure process for folding boxes? Modern Lithography 17, no. 4: 36-7 (April, 1949); *cf.* B.I.P.C. 19: 557-8.

Exception is taken to the assertion in the earlier reference that sheet-fed gravure presses and Intaprint plates assure absolute fidelity of reproduction on boxboard for the first time. The application of fine halftone screens up to 400 lines by offset lithography is not restricted to smooth surfaces; antique, fabric, and even ripple finishes will take fine halftones by lithography. Fine art reproductions produced by lithography are evidence of the fidelity of reproduction of this process. Lithography's resilient rubber offset blanket is particularly well adapted to handling the variations in sheet thickness of carton boxboard, as well as the rough surface stocks. Production of smaller cartons in three or four colors is likely to be in the more expensive short runs, where higher-priced gravure plates become a larger cost factor than is the case with less expensive lithographic plates. Four-color lithographic offset presses are available in sizes up to 52 × 76 inches which will put three times as

many duplicate images on a board sheet as the 29 × 43-inch Miehle gravure press under consideration. R.R.

HOPE, A. G. Offset rubber blankets. Paper & Print 22, no. 1: 76-7 (Spring, 1949).

The author discusses the oxidation of offset rubber blankets, their tackiness when treated with some solvents, and the resulting ink residue which may be left on the blanket after it is washed with an ink solvent. Unless the blanket is kept in good condition, undue strain is placed on the surface of the sheet; excessive tackiness may hold the paper so tightly to the blanket that the delivery grippers may be unable to separate the two surfaces. Offset paper should have a coating suitable for the process and should be waterproofed during its manufacture to provide resistance to the moisture film on the blanket. An enamel-type coated paper is smooth and uniformly receptive to ink and gives clear, sharp, faithful reproductions. A comparatively heavy paper is recommended. The ink must be sufficiently short to leave clean opaque imprints of the individual dots and also tacky enough to prevent the clouding of middle tones and to obtain a clear reproduction. R.R.

ST. JOHN, EUGENE. Printing of containers and wraps on cellulose tissue has become big business. Inland Printer 123, no. 1: 48-9 (April, 1949).

Comparisons are made between aniline, roll-feed letterpress, and gravure printing, the chief methods used in producing decorated cellulose tissue wraps, and general observations are given. Because ingredients of the product to be packaged may affect the inks used on the wrap, the nature of the product and its handling in production and in the finished container must be considered when the ink and method of printing are being selected. Surface printing on transparent film requires a negative and reverse printing a positive image. Ink odor is a major problem when printing wraps. For art work involving fine screen, soft tone, and fine color gradation, gravure is preferred. Its brilliance or opacity is obtained in one impression and it excels in facility, economy of time, and range. Letterpress is preferable where register is required, can be used for either side of a sheet, and is useful where the product is moist or greasy. Suitable metallic inks are now available for printing from rubber plates by the letterpress and aniline processes. Aniline inks are superior in luster and are obtainable in a wide variety of tints, as are those used for gravure printing. R.R.

PULP AND PAPER—IMPURITIES

DALTON, J. A., and WILTSHIRE, W. A. The systematic identification of spots and specks in paper. Paper-Maker (London) 117, no. 3: 173-4, 176-9 (March, 1949).

A system for identifying spots and specks in paper by a classification involving the use of 14 tables is described, which—with a little experience—will give a laboratory identification in five minutes or less. By means of the first table (preliminary classification), the allotment to a group (transparent or translucent and opaque) is arrived at by purely physical observation of the impurity. One of the 13 sub-groups is then determined by observation of the physical properties, and the corresponding table for common chemical and physical tests for further identification is consulted. There are occasions when spots can be assigned to more than one group and will give reactions for two groups. This usually applies when the spot is formed by a mixture of two quite different materials, such as a lime residue having

absorbed oil or grease. Normally, such cases can be identified with ease and are an additional help in tracing the source of contamination. E.S.

STRACHAN, JAMES. The abrasion of metal printing surfaces by sand in printing paper. Paper Market: 73-4 (March, 1949).

Very little work has been done on the presence in paper of sand or particles of hard mineral matter which scratch and abrade metal printing surfaces. Because cellulose contains no abrasive mineral matter, it is evident that any such material is introduced into paper during manufacture and it may be reasonably assumed that the papermaker should adopt practical means to mitigate the trouble. Finely divided alumina, derived from engine sizing, has a polishing action and abrades the sharp edges of type-faces; printing paper usually contains about 0.5% of this material. The chief abrasive mineral in paper is quartz sand, which may be introduced in the manufacturing process by the use of water from flooding rivers, through the residue left in sulfite liquor by the solution of magnesium limestone which invariably contains a small amount of sand, with baled esparto grass which has been exposed to sand storms, and as dust. Investigations of hundreds of samples from various sources made over almost 40 years show that the average sand content in sulfite pulp is 0.02% by weight and in sulfite printing papers 0.2%. R.R.

PULP STONES

BARRETT, W. W. Pulp stones and their use. Paper Mill News 72, no. 13: 55-6 (March 26, 1949).

The method of assembling the abrasive segments of a pulp stone by the Carborundum Co. is described, supplemented by five illustrations. More than 200 grit mixtures and structures are available to meet any set of mill conditions; the selection of a particular abrasive is determined by operating procedures and individual preferences of the users. E.S.

RAYON

KARNIK, M. G., and SEN, D. L. Some promising cellulose-bearing materials (other than cotton) for the manufacture of rayon. J. Sci. Ind. Research (India) 7: 351-6 (1948); Indian Pulp and Paper 3, no. 4: 169-73, 180 (October, 1948); *cf.* B.I.P.C. 15: 252.

Reeds, different varieties of bamboo, jute, and bagasse (as the most readily available raw materials in many parts of India) were subjected to alkaline cooks (with either sodium hydroxide alone or a mixture of sodium hydroxide and sodium sulfide) in an autoclave and bleached. The usual soda and sulfate processes yield reed and bamboo pulps with a high ash content and are, therefore, unsuitable for the viscose process. A preliminary treatment with hydrochloric acid reduces the inorganic (notably siliceous) matter considerably, resulting in ash contents as low as 0.14-0.21%. All pulps were tested for α-cellulose, ash, copper number, cuprammonium viscosity, 1% caustic solubility, and whiteness and the data compared with those of two imported pulps (an American alpha pulp and a Swedish bleached sulfite). The data compare favorably with those for the two imported pulps. Jute fibers gave the highest yield (58.86%), bamboo and reeds from 35-42%, and bagasse the lowest (32.95%). The bagasse and reed pulps were converted to viscose and the viscose samples into transparent sheets. The sheets were strong, although a slight milkiness was noticeable. This may have been caused by traces of carbon disulfide, which could not completely be removed. All experiments were carried out with the simplest possible equipment. E.S.

RESEARCH

PRIOR, P. H. A paper technician considers printing research. The Penrose Annual 43:77-8 (1949).

The author postulates that the logic of the situation requires that research in the printing field shall start from the printed result itself and work backward and outward through a consideration of the act of printing to the component materials that enter into it (platemaking, ink, paper, and printing). For instance, paper—as far as it concerns printing—cannot run ahead of progress in the earlier steps of this sequence. The papermaker is urgently in need of adequate scientific criteria by which he can judge his results, particularly quantitative tests, which will show him whether his experiments are in the right direction. It is essential that the workers in the various fields meet together; one of the first problems should be an agreement on the terms to be used to describe the various phenomena under discussion and thereby arrive at a common language on the subject. PATRA is, naturally, closest to the core of the problem and papermakers are dependent to a large extent on the Association's guidance—from the research point of view—as to the essential requirements of the printing process as far as paper is concerned. Contact with scientific workers along similar lines in other countries must also be maintained. E.S.

RESIN, SYNTHETIC

AGAHD, KONRAD. The chemistry of plastics. Das Papier 3, no. 3/4: 39-45 (February, 1949). [In German]

The author reviews synthetic resins and plastics of interest to the papermaker, giving starting products and methods of synthesis. The following are mentioned: cyanide derivatives, urea derivatives (the carbamide resins), melamine and its condensation products, silicones, and proteins. L.E.W.

BIXLER, A. L. M. Some special problems in the paper mill. Tech. Assoc. Papers 31: 589-90 (1948).

Resin impregnation on the paper machine is usually done with water-soluble resins. The author mentions some of the problems which are rather characteristic of a paper mill, including methods of resin analysis, resin efficiency determination, and the importance of flow of resin or resin-impregnated paper. His remarks are made with thermosetting resins, especially phenol-formaldehyde resins, in mind. R.R.

HONISH, J. K. Techniques for handling polyethylene resins. Paper Trade J. 128, no. 15: 19-21 (April 14, 1949).

The author describes techniques employed in coating, extrusion, and laminating with polyethylene resins. Applications of interest to the paper industry include solvent and hot-melt coatings, packaging films, lamination to other sheet materials, and as a wax additive to upgrade paraffin waxes. E.S.

KLINE, HARRY. Viewpoint of resin supplier. Tech. Assoc. Papers 31: 590-1; discussion: 591-2 (1948).

The resin-solids content is the total material left after the solvent has been removed as far as the manufacturer is concerned. Because not all the resin is taken up by the impregnated paper, the sheet does not necessarily have the same solids content as that figured by the resin manufacturer. The fact that the purchaser buys on a solids basis has resulted in a controversy

between the two parties which should be settled. The volatile test is good, practical, and easy to run, but it is an arbitrary measure of flow which depends greatly on the resin content of the paper; in addition, all phenolic resins do not flow the same way at the same volatile content. The discussion is concerned chiefly with testing for the solids content and the determination of wet-strength resins, which is of importance to mills using waste paper. R.R.

LARSEN, L. V. Resin content. Tech. Assoc. Papers 31: 588-9 (1948).

In the Forest Products Laboratory method of determining the content of water-soluble resins characterized by relatively low molecular weights and a high proportion of phenol alcohol in solution, an accurately weighed sample is put in a test tube, sealed, and heated in a bomb at 95° C. for 24 hours. The plug of cured resin remaining is dried and the residue is called the resin content. The Casein Co. of America method consists in placing a weighed resin sample in a weighing bottle, adding hydrochloric acid to precipitate or cure the resin, and evaporating the solvent; the final weight is considered as the value. A third method is to spread a sample on a relatively large surface and cure it for 15 minutes at 150° C. To determine the percentage of uncured resin in an impregnated filler at an early stage, a weighed sample can be placed under the laminating press accurately controlled for time and pressure. The resin which is squeezed out is scraped off and weighed; the weight loss is termed the flow. The test is limited to values of about 25-8% flow which varies with the filler and resin. When the flow is below about 8%, the degree of resin cure can be determined by the volatile test, measured by ascertaining the weight loss of a given sample of resin-impregnated filler after a specified drying time at a fixed temperature. When this drops to 1 or 2%, it becomes inaccurate and a third method is used, in which a weighed sample is immersed in acetone, dried, and weighed again. When the material is completely cured it will approach 0%. The volatile content test is losing and the flow test is gaining favor. R.R.

PATTERSON, D. G. The use of polyester resins with pulp and paper. Tech. Assoc. Papers 31: 583-4; discussion: 584-5 (1948).

A general discussion is given of polyester resins (which are hydrophobic rather than hydrophilic as are most of the other types of resins generally used with pulp and paper and, therefore, must be handled differently) and their uses. There is need for papers which will impregnate better with these resins, better creped kraft paper, papers for overlay work that will give better transparency, papers treated with moisture repellents and fungicides, and inks which will not bleed. R.R.

SEIDL, R. J. Resin treated papers for plywood overlays and for honey-comb core materials. Tech. Assoc. Papers 31: 596-9 (1948); *cf.* B.I.P.C. 18: 540.

The section on plywood overlays is almost identical with the earlier reference. In the second section the author considers chiefly honeycomb constructions with a core of resin-treated corrugated paper and covers of veneer or plywood. The core must be economical, structurally strong, and capable of good thermal insulation; the use of resin-treated paper and water-resistant glue bonds is practically a necessity. A cross banding of corrugated sheets and an assembly of the blocks of core, which may be sliced and used so that half the flutes are perpendicular to the covers, produce a core which offers a compromise on both strength and insulation and is not difficult to produce. A description is given of the core used in the honeycomb material of which an

experimental house was built at the Forest Products Laboratory and of the house itself. R.R.

SHEARER, HOWARD F. Vinyl resin fibers in papermaking. Tech. Assoc. Papers 31: 586-7; discussion: 587-8 (1948).

The principal vinyl resin-type fibers produced today are saran, Velon, Vinyon, and polystyrene. Vinyon is the only one sufficiently available in fine staple-fiber form to make it attractive for commercial paper use, but there is still much to be learned about it. The interest in these fibers for blends with others in the manufacture of certain specialty papers comes from their potential coalescent properties and their ability to bond the fibrous sheet without the addition of other bonding agents. The HH unstreched Vinyon staple is used successfully for paper, although Vinyon fiber length necessitates reduction to papermaking size and its low water absorption and thermoplastic properties may cause trouble during beating and dispersing. A discussion is given of a study made to overcome these troubles. By incorporating 15-25% vinyl-resin fiber in paper, its porosity is relatively unaffected and its folding endurance and wet strength are increased. Lightweight Vinyon specialty papers are used for tea bags, filter paper, packaging, hair waving, transparent overlays, and model airplanes; heavier paper is adaptable for use as battery plate separators, electrical applications, and molded preforms. Vinyon will not support combustion and, if used in appreciable amounts, will reduce the flammability of paper. R.R.

VAN NEDERVEEN, G. The use of plastics in the paper industry. Papierwereld 2, no. 6: 468, 470-1 (Oct. 1, 1947); V.I.-Pamphlet no. 3: 8 p. [1947] [In Dutch; second reference with English summary]

The author reviews the thermoplastic resins applied as a coating to the finished paper web and thermosetting resins added to the beater for producing wet-strength papers, with particular reference to melamine resins. Some of the advantages and applications of melamine-treated papers are given. E.S.

RESIN, SYNTHETIC—IDENTIFICATION

VAN LAMOEN, F. L. J. Color reactions for staining melamine and urea formaldehyde resins in paper. Papierwereld 2, no. 13: 598 (Jan. 15, 1948); V.I.-Pamphlet no. 5: 4 p. [1948] [In Dutch; second reference with English summary and 1 col. plate]

The staining procedures described by Stafford and co-workers (*cf.* B.I.P.C. 15: 356) have been checked at the Vezelinstituut T.N.O. with Solway blue BNS (a dye manufactured by Imperial Chemical Industries Limited) and the results of the previous investigators were confirmed. E.S.

RUBBER

ANON. Pliofilm "in production." Brit. Packer 11, no. 4: 20-2 (April, 1949).

Following a brief description of the opening ceremony of the Goodyear Pliofilm plant at Wolverhampton, a description is given of the method of production. High-grade natural rubber, broken down by passage through a rubber mill, is mixed with a solvent to produce a 20%-solids cement, aged with dry hydrochloric acid gas to give rubber hydrochloride, neutralized, heated, compounded, and filtered. The casting unit consists essentially of a spreading knife and a 165-foot neoprene spreading belt, which is perfectly

level and adjusted to maintain an exact distance from the knife. A small dam back of the knife holds several gallons of the cement which is drawn under the knife by the moving belt and dried at 200° F. to give a film. About 3000 pounds is produced daily. The film is well suited for export packaging and for applications in which extended shelf life and sales appeal are jointly required. The properties and technical data are given on moisture-vapor, air, and gas diffusion, the effect of temperature on diffusion, yield in standard gages, and physical strength characteristics. R.R.

TIERNEY, A. M., and COLLVER, J. P. 5 pounds in film. Modern Packaging 22, no. 8: 162-5, 278 (April, 1949); Packaging Parade 17, no. 195: 84-8 (April, 1949).

The Goodyear Tire & Rubber Co., Akron, Ohio, with the co-operation of other organizations, has conducted tests on consumer reactions to citrus fruit, apples, and potatoes bagged in Pliofilm and the practicability of handling such produce through regular commercial channels. With an additional 10% charged for the packaged fruit, the percentage of sales for oranges in bulk was 57%, in Pliofilm bags 35%, and in mesh bags 8%. When there was no price differential, oranges in Pliofilm outsold the bulk by 56% to 44%. A tabulation is presented of reasons given by purchasers for their choice. About two thirds of those who bought bulk fruit did so because they doubted the consistently good quality of packaged produce, thus emphasizing the fact that prepackaging will succeed only if the quality is carefully maintained. The use of bagging machinery was found to make possible the sale of bagged fruit at no extra cost. Carloads of apples packaged in Pliofilm and shipped from Washington as far as New York prove the practicability of the bags for long-distance shipping. Consumer-acceptance tests on this fruit have been made, but final reports have not yet been released. The enthusiasm of retailers who have had experience with selling heavy produce in Pliofilm bags is proof of their suitability for this purpose. R.R.

SETUP BOXES

ANON. The case for the set-up box. Modern Packaging 22, no. 8: 111-17, 270, 272, 274 (April, 1949).

Improved manufacturing techniques, new decorative materials, and better adhesives are greatly improving setup boxes to the point where they are the best and most economical package in numerous cases. Among the advantages common to many users of such containers are the following: no development costs are necessary unless art work is desired for designing special wraps; the user receives them ready for filling and needs no equipment or labor to set them up; being rigid and durable, they give good protection; they are easily opened and closed; users of small quantities often find them most economical because they require no dies; many have re-use value; they are often the ideal medium for the combination package; and they offer endless possibilities for decorative effect. Case histories are given in which packaging problems were solved by the choice of a setup box. Each salesman should be able to assist the user in developing the type of setup box required for a particular job. It is well for the buyer with a specific box problem to get information from a company which specializes in boxes for the product under consideration. The geographic location of the manufacturer is also important, since it affects shipping costs and delivery speed. Illustrations of setup boxes for various products are given. R.R.

SHIPPING CONTAINERS

ANON. Master cartoner. Modern Packaging 22, no. 8: 158-9 (April, 1949).

The demand for unit packages in master containers is a growing trend in the drug and cosmetic industries. The larger cartons protect unit packages from dust and damage and simplify inventory. They are usually simple chipboard folding cartons with brand name, quantity of unit packs, size, etc. printed on one or more sides. Machines are now available which automatically accumulate and "master carton" the smaller packages, cutting the necessary labor requirements by as much as 60%. A description is given of typical operations. R.R.

CARTER, N. New style box for transport of small livestock. Paper Box Bag Maker 107, no. 3: 85, 90 (March, 1949).

An illustrated description is given of a box which is strong, will admit interior ventilation even if a number of boxes or cartons are stacked together, and is suitable for packing and transporting small livestock, such as chicks; it is described in British patent 595,099. The carton is made of three-ply material, the outer layers being stout paper and the inner corrugated board. Each of the end sections is composed of panels defined by horizontally folded lines; the middle panel is shorter than the depth of the box and has, above and below, narrow panels which slant in and are provided with ventilation slots. The last panels of the end sections are provided with ventilation slots similarly arranged to those in the respective bottom slope panels; these panels are folded in to form an inner side panel. The bottom of the carton has two panels, the inner one preferably overlapping the outer to avoid the possibility of the chicks' claws being caught between the panels. R.R.

HUYE SPACE SAVING BOX SYSTEMS, INC., *New Orleans, La.* New chick container features ventilating post partitions. Shears 67, no. 676: 65 (April, 1949).

Specially designed corrugated ventilating post partitions are used to form chick boxes which will withstand stacking loads. When the chick box is used with the "wedge lock," no gluing or stapling is necessary. Another automatic locking container is available for shipping fresh produce. The lock fastens the covers to the boxes, affords easy opening and closing, and eliminates fasteners or sealing tape. Illustrations are given. R.R.

SHIPPING CONTAINERS—FROZEN FOODS

ANON. Fiberglas-insulated shipping container for frozen shrimp. Packaging Parade 17, no. 195: 83; no. 196: 83 (April, May, 1949); Am. Boxmaker 38; no. 5: 32-3 (May, 1949); Fibre Containers 34, no. 5: 80 (May, 1949).

A new low-weight inexpensive disposable container, in which Fiberglas insulation (type PF-612) is used to keep frozen food in good condition for as long as 24 hours without ice, has been developed by Envoldsen Shrimp, Inc., the Ohio Boxboard Co., Rittman, Ohio, and the Cleveland Fiberglas office. The container consists of a double paperboard box encasing a one-inch thickness of fiberglas insulation on the sides and top and two inches on the bottom; it holds 50 pounds of shrimp. R.R.

SHIPPING CONTAINERS—TESTING

TINIUS OLSEN TESTING MACHINE COMPANY. New compression testing machines. Fibre Containers 34, no. 3: 85-6 (March, 1949).

A brief illustrated description of two new types of compression testing machines is given, a 6000-pound tester for boxes 38 × 49 × 49 inches, and a 10,000-pound tester for boxes 36 × 36 × 6 inches. E.S.

SILICATE OF SODA

SODIUM SILICATE MANUFACTURERS INSTITUTE, *Philadelphia.* Features of silicate application. Shears 67, no. 676: 58-60 (April, 1949).

Helpful operating hints for the successful application of sodium silicate adhesives to corrugated board are given. The circulation of silicate of soda adhesive through the adhesive pans is essential to provide uniform adhesive temperature, prevent scumming, and carry away foreign materials. After leaving a pan, the excess silicate passes through a separator to remove such extraneous matter as paper particles and oil before being returned to the storage tank. The amount of silicate adhesive applied to corrugated board can be adjusted to less than 15 lbs./1000 sq. ft. of double-faced board. When boxes with high compressive strength are required, up to 20 lbs./1000 sq. ft. is justified, because rigidity increases in proportion to the increase in silicate spread. The adhesive bond must be uniform across the width of the sheet and should have a slight excess of silicate on both sides of the contact line. The usual clearances between glue rolls and between the adhesive transfer roll and the corrugating roll are given. Good quality steam, with a minimum moisture and noncondensable gas content, is necessary to condition the corrugating medium and maintain the proper surface temperatures. For efficient single-facer operation the following major points must be checked: lateral adjustment, lubrication, line-up, preheaters, corrugating medium, fingers, clearances, tension, and hoods. For double-back operations, line-up, preheaters, clearance, and tension should be checked. Recommendations are given for types of wipers. Warp is usually caused by uneven moisture distribution between board components. Suggestions are made for correcting this type of warp. Machine-direction warp is caused by excess tension on one of the liners and is entirely mechanical. R.R.

SODIUM CHLORITE

RUNKEL, ROLAND O. H. Production of wood pulp by means of sodium chlorite. Holzforschung 3, no. 2: 47-8 (1949). [In German] *cf.* B.I.P.C. 18: 630-1.

Graphs, erroneously omitted from the original article, are now published. These include numerous hydration and strength curves. L.E.W.

STARCH

MEYER, KURT H., BERNFELD, P., BOISSONNAS, R. A., GÜRTLER, P., and NOELTING, G. Starch solutions and pastes and their molecular interpretation. J. Phys. & Colloid Chem. 53, no. 3: 319-34 (March, 1949).

Starch solutions and pastes exhibit peculiar properties which can be understood only through a thorough knowledge of the physico-chemical behavior of the individual components of the starch granule and, in addition, of the morphological organization of the granule. Both components—the unbranched "amylose" and the branched "amylopectin"—show in solution the phenomenon of "aging." This consists in an aggregation of molecules to micelles and finally to a precipitate or a more or less turbid gel. New methods are described to check the purity of amylose and to determine the molecular weight of the components of starch. The results obtained explain the difference in behavior of cornstarch and potato starch which is shown, e.g., in swelling capacity, viscosity, and rate of solidification of the respective solutions and pastes. 30 references. E.S.

STATIC ELECTRICITY IN PAPER

AMERICAN NEWSPAPER PUBLISHERS ASSOCIATION. Static elimination. Am. Newspaper Publ. Assoc., Research Bull. no. 6: 9-26 (Feb. 3, 1949).

Means now available for static elimination are discussed, including electric bars, gas bars, heat and powder spray, tinsel, infrared heat, and controlled humidity. One section is devoted to the Alphatron static eliminator which makes use of polonium as a neutralizer. A special section is given to the Ionotron bar, which uses radium to accomplish static elimination. Measurements and tests conducted with the Ionotron bar are included. Radium emits α-, β-, and γ-rays. A by-product of the disintegration process of radium is a deadly and chemically inert gas, called radon. Certain limitations placed on radon gas concentrations in workrooms are explained. Charts are included giving estimated safe distances from radioactive sources; these are greater for β- than for γ-rays, the reasons for which are explained. Also discussed are the possible injurious effects of radiation (from radium) on operating personnel. A summary is given dealing with the application of the Ionotron in newspaper publishing. 16 references. E.S.

STEAM POWER

APLER, T. Automatic sweeping. Svensk Papperstidn. 52, no. 6: 145 (March 31, 1949). [In Swedish]

Reference is made to the first Swedish automatic sweeping installation with complete control developed and built in 1948 by A/B Superior in Stockholm for the Forss Aktiebolags Cellulosafabriker in Köpmanholmen. The process works with compressed air and is continuous. As soon as a complete sweeping cycle of a boiler (lasting about two hours) is completed, a new cycle starts, so that one boiler is swept approximately 12 times in 24 hours. The possibility of applying this principle to the evaporation of sulfite waste liquor is mentioned. E.S.

KARPINSKI, JOHANN. High pressure or low pressure—reciprocating steam engine or steam turbine? Das Papier 3, no. 3/4: 49-53 (February, 1949). [In German]

The author discusses all the factors which must be taken into account before deciding on the selection of the steam-generating equipment for a pulp and paper mill, such as pressure, vapor tension, purchased power, fuel supply, utilization of waste heat, maintenance, etc. No generally applicable rules can be made; each problem must be treated individually. E.S.

STEEL STRAPPING

GERRARD STEEL STRAPPING COMPANY, *Chicago, Ill.* Wire-tying bundles of boxes or cartons. Fibre Containers 34, no. 3: 101-2 (March, 1949).

An illustrated description is given of a semiautomatic round strap-tying machine for bundling knocked-down corrugated and solid fiber boxes, partitions, and folding cartons. The usual minimum with this model is about 15 ties per minute, the rate increasing with the skill and practice of the operator. A hand-operated model performs exactly the same operations, except that it is not quite as fast. However, it is more adaptable to situations where different sizes, shapes, styles, etc. are involved. E.S.

STRAW

ARONOVSKY, S. I., and LATHROP, E. C. New mechano-chemical process for pulping agricultural residues. Tappi 32, no. 4: 145-9 (April, 1949).

A new process has been developed for pulping agricultural residues involving combined and simultaneous chemical and mechanical action on the raw material at atmospheric pressure and at temperatures at or near 100° C. Excellent strawboard pulps were produced by cooking wheat straw for one hour in a laboratory Hydrapulper, using the normal amounts of chemicals. Strong, easy-bleaching kraft straw pulps were made in a half-hour cooking period in this equipment. Re-use of the kraft black liquor from the Hydrapulper for three successive subsequent cooks had no appreciable effect on the yields or properties of the resulting pulps. The final black liquor contained more than 7% of organic matter. A possible explanation for the rapid pulping action in the Hydrapulper is given. The significance of these preliminary results and the advantages of this method of pulping are discussed. This mechano-chemical process might have considerable influence in increasing the use of agricultural residues for paper, board, and their products. E.S.

KRANCHER, C. G. Interest is reviving in straw paper manufacture. Paper Ind. 30, no. 12: 1741-4 (March, 1949).

The author reviews the manufacture of 9-point strawboard, discussing, in turn, the characteristics of straw paper, raw materials, straw procurement, manufacture of straw pulp, board machines, the need for improved quality, and the problem of lowering costs. Brief reference is made to the Morley continuous straw cooking process developed in England and to the possibilities of the Hydrapulper for cooking straw pulp. E.S.

ROOT, EDWARD M. Hydrapulper cooking and pulping of cereal straws. Paper Mill News 72, no. 13: 58-9 (March 26, 1949).

The author describes the advantages of the Hydrapulper method of cooking and pulping straw, which is claimed to replace the rotary digesters, pits, conveyors, breaker beaters and, to some extent, washers. It is feasible to furnish whole straw in bales to the Hydrapulper, chemical requirements being equal to or less than those normally used in pressure cooking. The hydrapulped straw can be washed readily by vacuum or counterflow washers and be sent from there directly to Hydrafiners and jordans, and then to the paper machines. Yields of 75% can be easily attained. Hydrapulped straw shows better delignification and better hydrating and felting characteristics than ordinary straw pulp. Experiments also showed that it is possible to produce easy-bleaching straw pulps, the results with kraft chemicals being particularly promising. Yields up to 60% of screened pulp were shown to be feasible. E.S.

STREAM POLLUTION

BALMER, R. R. Company administration and technical organization for industrial waste control. Sewage Works J. 21, no. 2: 268-73 (March, 1949).

Industrial waste disposal problems within a company create the need for three things: a company policy on the subject, administrative procedures to carry out that policy, and an organization to investigate and develop proper disposal facilities. If industry is to meet its responsibilities to the public in this respect, many companies will have to review their policies and procedures for handling this important subject. The author discusses the waste

organization and administrative requirements for small, medium, and large companies describing, in conclusion, the du Pont waste control organization as an example of what has evolved in a company with many and varied industrial waste-disposal problems. E.S.

RUDOLFS, W., *and others.* A critical review of the literature of 1948 on sewage and waste treatment and stream pollution. Sewage Works J. 21, no. 2: 228-67 (March, 1949); *cf.* B.I.P.C. 18: 634.

A general review of the pertinent literature for 1948 is given. A special section of industrial wastes is devoted to pulp and paper (p. 245-7); the final section on stream pollution (p. 254-8) should also be of interest to the industry. 287 references. E.S.

VAN HORN, WILLIS M. A study of kraft pulping wastes in relation to the aquatic environment. Limnological Aspects of Water Supply and Waste Disposal: 49-55 (Washington, Am. Assoc. for the Advancement of Science, 1949).

The major stream polluting products from the normal operation of a kraft mill are: the initial blowdown condensate, the final blowdown condensate, the evaporator condensate, and soaps and other materials in the dilute wash waters. Certain sulfur components in the wastes have been found to be toxic to fish and other aquatic fauna. Remedial measures are discussed to prevent the harmful components from reaching the stream, such as tall oil and turpentine recovery, lagooning, and removal of the sulfur compounds in wooden absorption towers. 11 references. E.S.

WESTON, ROY F. The industrial plant waste disposal survey. Sewage Works J. 21, no. 2: 274-85 (March, 1949).

An approach is outlined for obtaining basic information essential to the selection of adequate and economical pollution abatement procedures. It has been found advantageous to conduct the plant survey in four basic steps: a comprehensive survey of the plant and receiving stream to establish the basic pollution-abatement problem; research investigations to devise abatement procedures or processes; development work to establish the applicability and economics of proposed procedures; and engineering surveys to define the layout and physical aspects of the existing plant pertinent to the selection of pollution abatement procedures. It should be borne in mind at all times that pollution abatement is not necessarily synonymous with waste treatment; it may be partially or completely accomplished by conservation measures, waste-utilization procedures, and/or process changes without providing waste-treatment facilities. Obviously, the amount of investigational research and development work carried out must be governed by the magnitude and complexity of the problem. General directions for the different stages of the survey are given. E.S.

SULFATE MILLS

ANON. First technical details of MacMillan pulp plant. Western Pulp and Paper 2, no. 4: 8-9, 34 (April, 1949); *cf.* B.I.P.C. 19: 507.

A report is given of the equipment and processes to be used in the Nanaimo Sulphate Pulp Ltd. plant on Vancouver Island. About 80-90% of the chips used will be made from wood waste from the company's saw mills; the remainder will come from a whole log chipper capable of supplying full mill requirements if necessary. The whole logs in 25-foot lengths and up to 34 inches in diameter will be fed to a six-knife 153-inch disk Sumner

chipper. Seven chip-storage silos will permit the segregation of wood species. Four stainless steel-lined digesters with a capacity of 4700 cu. ft. each, a three-stage single drum Impco washing system, a Bristol stock-blending system, six lines of Waterous flat screens, two Sherbrooke deckers, Shartle agitators, a 178-inch Fourdrinier with an 80-inch wire, and a Flakt drier are part of the equipment to be installed. The main source of steam will be from a Combustion Engineering recovery furnace burning concentrated black liquor. Two hog fuel boilers will provide additional steam requirements. A four-cell Cottrell electrical precipitator will also be utilized. R.R.

ANON. Story behind LongLac. Pulp and Paper 23, no. 4: 40-2, 45-6, 48, 50 (April, 1949); Paper Ind. 31, no. 1: 36-9 (April, 1949); *cf.* B.I.P.C. 19: 492.

Much of the material in this article is similar to that given in the earlier reference. Illustrations of the plant and its equipment and a flow sheet are included. R.R.

ANON. Weyerhaeuser kraft mills: one is up—one to go. Pulp & Paper 23, no. 4: 59, 61-2, 64, 66-8, 71 (April, 1949).

The Longview, Wash., Weyerhaeuser kraft mill is producing 200 tons a day of market pulp; the Springfield, Ore., plant will soon be making 150 tons of containerboard. A detailed illustrated description is given of the six-stage bleached-kraft mill which uses chiefly bark-free slabs from the sawmill, small wood from prelogging, and Douglas fir. The principal unit in the machine room is a new Rice Barton machine with a removable Fourdrinier and Minton vacuum drier, producing a sheet 150 inches wide at a speed of 250 ft./min. A 240-ton Babcock & Wilcox unit is in the boiler plant. Most of the approximately 800 motors in the plant are from Westinghouse. Instrumentation is as complete as is practical. Large amounts of stainless steel are used at points of high corrosive susceptibility. Four concrete silos provide storage for about four days' operation at the sulfate mill. Five Combustion Engineering welded stainless-steel digesters, a batch-system bleach plant, a six-body quintuple-effect evaporator and a disk evaporator, a Tomlinson recovery furnace, and a Cottrell electric precipitator are part of the equipment. R.R.

SULFITE WASTE LIQUOR

ENEBO, LENNART. Experiments concerning the yield of alcohol from the fermentation of sulfite waste liquor. Svensk Papperstidn. 52, no. 5: 101-6 (March 15, 1949). [In Swedish; German and English summaries]

The author determined the alcohol yield from the fermentation of sulfite waste liquor by experiments with waste liquor and sulfite distillery slops to which a certain quantity of glucose had been added. The fermentations were carried out partly without agitation and partly in an agitated nutrient medium in a shaken thermostat according to Myrbäck or on a larger scale. The agitation caused a decrease in the alcohol yield, a fact which must be taken into account when the shaken thermostat is used for routine control in sulfite alcohol production. Calculations based on the amounts of alcohol, carbon dioxide, and yeast substance formed show that—at a production of about 0.6 g. dry yeast per liter of sulfite waste liquor—the alcohol yield approaches 91% of the value according to Gay-Lussac's equation. The author concludes from these data that relatively greater proportions of the sugar are used for the growth of yeast cell substance and somewhat lesser proportions are available for alcohol production when the more dilute sugar solutions are used. 10 references. E.S.

TANNING

LIPSITZ, PAUL, KREMEN, SEYMOUR S., and LOLLAR, ROBERT M. Studies of vegetable tannage. VII. The tanning potential of purified lignosulfonates and true tannins. J. Am. Leather Chemists' Assoc. 44, no. 4: 194-204 (April, 1949); *cf.* B.I.P.C. 19: 201.

A study of the tanning potential of purified quebracho, wattle, and fractionated lignosulfonates has been made. Results of the tannage of calfskin pieces with these materials indicate: Leather made with the purified natural tannins (i.e., quebracho and wattle) has characteristics similar to those of leather made with a commercial tannin. Magnesium lignosulfonate and its several fractions precipitated by magnesium chloride can give a leather comparable in chemical analysis and "feel" characteristics to leather produced with natural vegetable tannins. Results with the ninhydrin test suggest that amino specificity is of little importance in regard to tanning potential, but that leathering ability is the result of some other mechanism. Calfskin tanned with wattle and quebracho possesses a high resistance to tryptic hydrolysis, but a lignosulfonate tannage permits considerable tryptic attack. 13 references. E.S.

VANILLIN

ADLER, E., and HÄGGROTH, S. The formation of vanillin and acetaldehyde from lignin and lignosulfonic acid with alkali. Acta Chem. Scand. 3, no. 1: 86-8 (1949). [In German]

According to Kratzl (*cf.* B.I.P.C. 18:838) lignosulfonic acid, when treated with alkali, gives vanillin (I) and acetaldehyde (II), whereas wood itself does not. According to Adler, the formation of (I) and (II) results from the presence of a coniferyl aldehyde group in lignin and, since such a group is also present in protolignin, wood itself should give (I) and (II). To clear up this discrepancy, pre-extracted sprucewood was heated with 24% sodium hydroxide in a nitrogen atmosphere, giving (I) and (II) in amounts corresponding to one coniferyl aldehyde group per each 40-60 methoxyl groups in the lignin. A similar result was obtained with isolated native lignin. Because lignosulfonic acids gave considerably more (I) and (II) than is accounted for on the basis of the coniferyl aldehyde groups, another type of group giving (I) and (II) must be present. This is shown by the fact that, when lignosulfonic acid is heated with 0.1 *N* sodium hydroxide, (I) and (II) are formed in amounts corresponding to the number of coniferyl aldehyde groups and, on further heating with 24% sodium hydroxide, more (I) and (II) are liberated. F.E.B.

VIBRATION

SPAETGENS, T. W. The nature of mechanical vibrations. Western Pulp and Paper 2, no. 4: 14-17, 26 (April, 1949).

The author discusses those vibrations which cause destruction to machinery without necessarily causing any obvious physical disturbances, such as axial, flexural, panel, and particularly torsional vibrations, and vibrations caused by unbalanced machines and resulting in the lowered efficiency of both workers and machines. By properly suspending an unbalanced machine on resilient mountings, extreme fatigue, impaired health, and lowered efficiency in workers can be eliminated; the machine is made more efficient—a machine on a rigid foundation can waste up to 10% of its rated capacity by dissipating energy in its foundation and vicinity; work spoilage is eliminated; maintenance costs are reduced; and greater efficiency of plant layout and a lighter floor and building design are possible. Mechanical vibrations

are the source of more machine troubles than is generally known; a Diesel generator unit is particularly susceptible. The damage there is usually done by torsional vibration, which can become critical in almost any machine having rotating shafts. Torsional vibration must not be associated with unbalance; it can exist in a perfectly balanced machine. Few industrial plants offer such a complex field for mechanical vibrations as pulp and paper mills. Each of the several hundred shafts in a paper machine, for example, may develop individual vibrations which affect the operation of the machine. With the growing emphasis on higher speeds in the manufacture of pulp and paper, the problem of vibration is becoming increasingly important. R.R.

WASTE PAPER

WASTE PAPER INSTITUTE. 42 new waste paper standards adopted. Paper Trade J. 128, no. 13: 7, 32, 34 (March 31, 1949); Fibre Containers 34, no. 4: 52, 54, 59-60, 62 (April, 1949).

The grade definitions of the 42 new standards are given. E.S.

WAXES

JENKINS, HUBERT W., and FRIEDMAN, HAROLD B. Modern wax technology. J. Chem. Education 26, no. 4: 182-6 (April, 1949).

The authors discuss the sources, method of securing, processing, and uses of carnauba, ouricuri, cauassú, candelilla, sugar-cane, esparto, Japan, cotton, and miscellaneous minor vegetable waxes, paraffin, montan wax, ozokerite, ceresin wax, beeswax, Chinese insect, shellac, and spermaceti wax. R.R.

WET STRENGTH

BRITT, K. W. Review of developments in wet strength paper. Tech. Assoc. Papers 31: 594-6 (June, 1948).

Two absorbent papers, identical except that one had been given wet-strength treatment, were wetted to various degrees with water and tested for strength. Tabulated data show that wet strength is of importance even when the paper is not soaked in water. In the range from 12 to 15% moisture content, which can be obtained by exposure to damp atmosphere, the differential in pounds tensile between the treated and untreated papers is as great as in the saturated condition. Three phases are considered in the development of synthetic resins for wet-strength paper; (1) the use of water-soluble urea formaldehyde condensation products of low polymerization as a tub size or surface-application treatment; (2) the development of resins which can be added directly to the papermaking stock to be absorbed by the fibers (these resins are more highly polymerized but still retain water solubility or dispersibility); and (3) the development of urea resins which are naturally cationic and are absorbed by the fiber more efficiently and under a wider variety of conditions than formerly. The ultimate importance of the last step is still to be evaluated. The introduction of wet-strength papers has resulted in problems regarding testing procedure and quality control, definitions of what is and what is not wet-strength paper, waste-paper recovery, and the technical control of a wet-strength process. R.R.

JOHANSSON, O. S. The defibering of wet-strength paper. Svensk Papperstidn. 52, no. 6: 142-4 (March 31, 1949). [In Swedish; German and English summaries]

Experiments are described for determining optimum conditions of temperature and pH when defibering wet-strength papers. Two M.G. kraft

papers were used in these experiments; they were prepared under identical conditions, except that (I) was sized with melamine and (II) with urea resin. The samples were cut into pieces and soaked at a consistency of 2% in water whose temperature and pH (with hydrochloric acid) were adjusted to definite values. The wetting period lasted in most cases for 30 minutes, after which time the pH generally increased. A few experiments were extended to four hours. The samples were then immediately defibered for 15 minutes in a 2-liter laboratory disintegrator. In order to evaluate the degree of defibering, laboratory sheets were prepared of approximately 25% defibered pulp and 75% bleached sulfite; in such sheets nondefibered sections could be detected readily. The results are tabulated. It was found that—in order to obtain the same degree of defibering with identical mechanical treatment—(I) requires a higher temperature and/or a lower pH than (II). No damage to the fibers results when solutions with a pH as low as 2 at 80° C. are employed for the comparatively brief periods. The breaking length was determined for a few of the completely (or almost completely) defibered samples, prepared according to the British standard procedure at the identical basis weight as the original machine-made papers (47 g./sq. m.). The values were rather uniform (from 3.62-3.95 kg.) in spite of variations in the preceding treatment. When an ordinary rosin-sized kraft paper was subjected to complete defibering and identical treatment as (I) and (II), the tensile strength of its laboratory sheet amounted to 65% of the original strength in the machine direction (III) and to 113% in the cross-machine direction (IV). The corresponding best values for samples of (I) were 71% and 125%, and for (II), 67% and 110%, respectively, for (III) and (IV). In conclusion, the author states that the re-use of wet-strength papers at present involves operating difficulties and additional costs, unless new synthetic resins are developed which will allow a complete and easy defibering of the treated paper. E.S.

MAXWELL, C. S. Identification of wet strength broke. Tech. Assoc. Papers 31 : 592-3 ; discussion : 593-4 (1948).

The basic method used for distinguishing urea and melamine in wet-strength paper is a dye-stain technique based on the fact that the base paper is unaffected by acid dyes and yet picks up dye very readily when melamine or urea resin are present. There are refinements which distinguish between glues, urea, and melamine. Such a method, however, is not rapid enough for sorting paper in a mill. The striping of wet-strength paper with a distinctive color while it is on the paper machine is the method used successfully by several large companies to distinguish such paper. The difficulty with this method is that the resulting product cannot be used for many purposes. Other possibilities are mentioned. More practical approaches to the problem may be through the use of the Hydrapulper which breaks up both wet-strength and regular stock very well and through the application of high-pressure steam to the beaters. The only economically sound way of removing the resin is with heat at a low pH. R.R.

YORKE, N. R. Wet strength tests for laminators. Tech. Assoc. Papers 31 : 592 (1948).

For laminators the wet strength of paper means its strength when subjected to immersion in laminating varnish solutions. When the impregnated paper is run between rollers to squeeze out the resin, the pressure may cause the paper to spread and actually produce a hydraulic pressure within the paper which causes the resin to flow between the fibers and disrupt them. Therefore, there is need for a control test for the strength of paper that is to be subjected to immersion in resin-alcohol solutions as well as others. R.R.

WOOD—SACCHARIFICATION

HARRIS, ELWIN E., and KLINE, ALBERT A. Hydrolysis of wood cellulose with hydrochloric acid and sulfur dioxide and the decomposition of its hydrolytic products. J. Phys. & Colloid Chem. 53, no. 3: 344-51 (March, 1949).

The rates of hydrolysis of Douglas-fir cellulose in dilute hydrochloric acid and in aqueous sulfur dioxide were determined. These rates were compared with those in sulfuric and phosphoric acids, which had been previously determined (*cf.* B.I.P.C. 15: 226; 18: 271). On a molar basis, hydrochloric acid hydrolyzes cellulose at about the same rate as sulfuric acid, whereas sulfur dioxide gives about one seventh the rate of sulfuric acid. The net yield of reducing sugar was not as high with sulfur dioxide as with hydrochloric or sulfuric acid. E.S.

LOCKE, EDWARD G. Using wood residues to manufacture feed. Chemurgic Digest 8, no. 4: 12-13 (April, 1949).

Wood-sugar molasses, the sugar portion containing about 84% glucose and 16% xylose when made from waste Douglas fir, has been found a suitable high-energy food supplement for stock and poultry. The hogged wood is placed in percolators, steamed, and treated with 0.5% sulfuric acid. Furfural and methyl alcohol are produced as by-products. The sugar-acid solution is neutralized with a lime slurry and the calcium sulfate sludge removed by filtering at a raised temperature and pressure. The solution is flash cooled to give a 10% concentration. Filter-aid is added and the solution is again filtered. At the end of a two-stage evaporation the molasses (about 45% sugar) is ready for market. Additional development work must be done before plants for this process are built. A semicommercial molasses plant could be constructed economically in connection with the Springfield, Ore., alcohol plant, which will probably be operating experimentally again within a few months. R.R.

SHAW, A. O. Wood molasses for dairy calves. Chemurgic Digest 8, no. 4: 13-14 (April, 1949).

Two groups of calves, used in a 15-week trial to determine the nutritional value of wood molasses, were similarly fed except that one group was given two pounds of wood molasses per day for the first eight weeks and four pounds per day for the second seven weeks in addition to the regular diet. Measurements and weights of the cattle and records of feed consumption were kept. The gains made by each group are tabulated, showing that 560 pounds of molasses caused an advantage in weight of 79 pounds for the first period and that 980 pounds produced a weight advantage of 76 pounds in the second period. R.R.

WOOD DISTILLATION

ARIES, ROBERT S. A movable wood distillation unit. Chemurgic Digest 8, no. 4: 7-9 (April, 1949); *cf.* B.I.P.C. 17: 734.

Demountable, easily erected charcoal installations, of value in regions where transportation is poor or where fire, wind, etc. have damaged the wood, are designed for a daily output of 1000-6000 pounds of charcoal. The author describes equipment details and the necessary materials of construction, including their approximate cost, for an installation with a daily output of 6500 pounds. The total cost is about $8800. A sketch is given showing the details of a movable wood distillation plant. R.R.

WOOD OPERATIONS

CALLAHAN, JAMES D. Mechanized pulp logging. Wood 4, no. 4: 18-19 (April, 1949).

A brief illustrated description is given of the mechanized pulp logging program of the Crossett Lumber Co., with particular reference to chain saws, a pulpwood splitting gun, and a new type of loader. E.S.

WOOD WASTE

CARTER, ROY M. Byproducts from mill waste. Report 8th Vermont Wood Products Conference: 7-18 (1948).

With brief reference to the volume of unused wood available in New England, the author discusses possible outlets for this waste under the headings: uses for sawdust and shavings; uses for slabs, edgings, and trim; special by-products; wood flour; coarse fiber products from wood waste; dry-formed wood-waste products; wood-sugar molasses; sawdust—cement, concrete; bark utilization; wood waste as soil supplement; and a gasogen powered sawmill. 23 references. E.S.

YEAST

ANON. Wisconsin campaign; also, yeast plant progress. Pulp & Paper 23, no. 4: 35-6 (April, 1949).

The Wisconsin Sulfite Pulp Manufacturers' Research League, organized in 1939 to work on the disposition of spent sulfite liquor, has recently printed three advertisements in local papers of the Fox River Valley to clarify the sulfite pollution problem. The first advertisement cited three conditions of pollution: bacteria in water, algae, and oxidation reduction caused by industrial wastes; the second explained what has been done in the past 30 years on the sulfite liquor-disposal problem; and the third discussed four projects which are being carried out by the sulfite industry: the destruction of sugars with yeast, the evaporation and burning of the liquor, vanillic acid production, and the use of the liquor as a road binder. In addition, details of the operation of the Lakes States Yeast Corp. plant at Rhinelander, Wis., have been released. From the operation of this plant, it has been determined that a plant using the process would cost about $10,000 per daily ton of sulfite capacity served by the yeast plant. In the process, the liquor is put into a vat where the yeast plants are grown. The fluid and yeast are drawn from the bottom of the tank and concentrated by centrifuging to a 15% yeast cream. Dehydration on heated rollers produces a yeast product which is being tried as stock feed. An attempt will be made to make another yeast product of importance as a vitamin source at the League's Appleton pilot plant. Plans are under way to test new Swedish-type equipment for evaporating and burning the liquor. R.R.

MCGINNIS, JAMES. Yeast in diets for poultry. Chemurgic Digest 8, no. 4: 20-2 (April, 1949).

Because of its high protein content and its ability to convert inorganic nitrogen and carbohydrate to protein, yeast is receiving increasing attention as a potential commercial protein supplement in poultry feeds. From a review of experiments made, it seems that different types of yeast may be used satisfactorily in chick diets providing it is not fed at too high a level or when the chicks are too young. Either Torula or brewers' yeast can be used as a substitute for up to 10% of soybean oil meal for turkey poults; it is also an effective riboflavin supplement. Torula yeast is satisfactory for egg production but not for hatchability. Yeast in breeding rations should be

supplemented with some material such as fish meal which is rich in an unidentified factor required for reproduction. R.R.

ZEIN

OFELT, C. W., and EVANS, CYRIL D. Aqueous zein dispersions. Ind. Eng. Chem. 41, no. 4 : 830-3 (April, 1949).

Zein is dispersible in strong alkali metal hydroxides only within the narrow pH range of 11.3 to 12.7. Quaternary ammonium hydroxides are also dispersing agents but are somewhat inferior to the alkali metal hydroxides. Zein is not dispersible in ammonium hydroxide or in calcium hydroxide solutions. The amount of alkali required to disperse zein is low; based on the weight of zein, 1.4% (minimum) to 6.4% (maximum) of sodium hydroxide is required for the preparation of a 10% zein dispersion. The dispersibility of zein is attributed to the formation of the alkali salts of the phenolic hydroxyl groups of tyrosine. Zein is dispersible also in strong acids (12 *N* hydrochloric). The pH dispersion curves, viscosity curves, and stability data are presented for aqueous alkali-zein dispersions. 13 references. E.S.

Patent Section

Although the abstracts of the United States patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. The abstracts of the Canadian patents are prepared from the claims published in the* Canadian Patent Office Record. *In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents are available only as manuscript or photostatic copies. They are furnished by the Commissioner of Patents, Ottawa, Canada. An estimate of the cost of a patent should be obtained in advance of the order.

ALKALINE PROCESSES

WELLS, SIDNEY D. Method of digesting pulp by the alkaline process. U. S. patent 2,466,290. Filed March 15, 1944. Issued April 5, 1949. 1 claim. Assigned to The Institute of Paper Chemistry.

A method is provided for regulating the admission of active chemical into the batch or circulating liquor in accordance with the condition or chemical activity of the circulating liquor at the time the chemical is added. The process consists of the following steps: circulating alkaline cooking liquor continuously in a closed circuit through a batch of pulp in the digester; adding supplemental alkali to the circulating stream of cooking liquor substantially continuously; continuously reheating the circulating stream of cooking liquor and returning it to the digester; continuously and automatically measuring the electrical conductivity of the stream of cooking liquor coming from the digester; and controlling the additional supplemental alkali supply as a function of the measured conductivity of the liquor in the circulating stream. C.J.W.

BLEACHING

BRABENDER, GEORGE J., BARD, JOHN W., and DAILY, JAMES M. Method of bleaching cellulosic pulp. U. S. patent 2,466,633. Filed May 26, 1948. Issued April 5, 1949. 7 claims. Assigned to James M. Daily, Francis L. Daily, and Joseph F. Ryan.

Pulp containing from 45 to 75% moisture at a pH of 5 to 6 is treated with air containing 0.5% ozone at room temperature. C.J.W.

BLEACHING—GROUNDWOOD

MCEWEN, ROBERT L. Method of bleaching mechanical wood fibers. U. S. patent 2,465,738. Filed Dec. 22, 1945. Issued March 29, 1949. 3 claims. Assigned to Buffalo Electro-Chemical Company, Inc.

Mechanical pulp at a consistency of 20 to 35% is treated with a mixture of 2% hydrogen peroxide and 8% sodium silicate at a temperature between 40 and 50° C. for one to four hours. C.J.W.

BOARD

CONOVER, JAMES H. Treatment of cellulosic pulps. Canadian patent 456,093. Filed Nov. 15, 1946. Issued April 26, 1949. 15 claims.

The freeness of a mechanically hydrated pulp is increased by the addition of an alkaline earth hydroxide (e.g., 1% or more of calcium hydroxide). The patent also covers a fiberboard containing cellulosic fibers and 1% or more of calcium hydroxide having a density of at least 25 lb./cu. ft., a modulus of rupture of at least about 800, and a tensile strength of at least 500 p.s.i. Another claim covers the precipitation of rubber particles upon fibers by treating a mixture of rubber emulsion and fibers with lime. C.J.W.

BOARD SPECIALTIES

DUNLAP, CHARLES K. Textile cone. Canadian patent 456,058. Filed Aug. 5, 1947. Issued April 19, 1949. 6 claims. Assigned to Sonoco Products Company.

This is equivalent to U. S. patent 2,430,710 (Nov. 11, 1947); *cf.* B.I.P.C. 18: 274. C.J.W.

LARKIN, JAMES L. Foldable display panel with collapsible support. U. S. patent 2,466,599. Filed Jan. 11, 1944. Issued April 5, 1949. 10 claims. Assigned to Forbes Lithograph Manufacturing Company.

The display consists of a foldable panel and a collapsible support, the support and panel being proportioned for collocation when collapsed as a flat packet with the folded panel between the parts of the support to be covered and protected thereby throughout its area on both sides. C.J.W.

CALCIUM CARBONATE

FLECK, LOUIS C. Method of producing chalk. U. S. patent 2,467,082. Filed June 11, 1948. Issued April 12, 1949. 5 claims. Assigned to Paper Patents Company.

Chalk (calcium carbonate) having a maximum particle size of 15 microns and suitable as a coating material for paper is prepared by carbonating an aqueous calcium hydroxide slurry in the presence of sugar beet residue extract until chalk crystals are formed. The carbonation can be carried out at temperatures from 20 to 75° C. The sugar-free beet-residue sludge containing 50% solids (540 parts by weight) is mixed with 800 parts of water and the pH is adjusted to about 9.2. Of this extract, 500 parts are added to a slurry of 150 parts of quick lime in 1000 parts of water, treated with 24 parts of calcium hypochlorite at 70° C. to remove the coloring matter, and then carbonated at about 70° C. to a pH of about 7.8. Sufficient sulfur dioxide water is added to destroy the bleaching agent and three parts of sodium carbonate are then added to convert any calcium chloride formed by the bleaching agent to the carbonate. The carbonate crystals thus produced have a brightness of over 96%. C.J.W.

DISPENSING CONTAINERS

KEYL, ALEXANDER C. Dispensing container for dusts. Canadian patent 456,206. Filed Nov. 13, 1947. Issued April 26, 1949. 6 claims. Assigned to The Sherwin-Williams Company.

A dust-containing tube is formed of spirally wound paper stock and an internal dust-dispersing element comprised of a plurality of plies of corrugated paperboard extending lengthwise the tube. C.J.W.

FOAM

RAWLING, FRANCIS G. Method of suppressing foam on paper stock. Canadian patent 456,066. Filed Nov. 14, 1947. Issued April 19, 1949. 4 claims. Assigned to West Virginia Pulp & Paper Company.

This is equivalent to U. S. patent 2,429,030 (Oct. 14, 1947); *cf.* B.I.P.C. 18:208. C.J.W.

FOLDING BOXES

CARTER, NORMAN. Box or carton made of cardboard or similar materials. Canadian patent 455,450. Filed June 11, 1946. Issued March 29, 1949. 6 claims.

A box is formed from a foldable blank which, when erected, provides sides of double-walled construction, the inner and outer walls of which are formed, respectively, with internal and external ventilation openings. The portions of the outer walls containing the external ventilation openings are sloped so that ventilation is assured when the boxes are stacked. C.J.W.

HARTMAN, DON B. Collapsible box. U. S. patent 2,465,588. Filed Sept. 30, 1947. Issued March 29, 1949. 8 claims. Assigned to Owens-Illinois Glass Company.

The invention covers small open-top boxes which are used for packaging berries and small fruits and which are formed from a blank that can be folded and interlocked. C.J.W.

LAMBERT, RUSSELL A. Carton. Canadian patent 455,966. Filed Nov. 23, 1946. Issued April 19, 1949. 5 claims.

The construction of a carton with four flaps forming the closing means is described. C.J.W.

LAMBERT, RUSSELL A. Carton blank. Canadian patent 455,965. Filed July 19, 1946. Issued April 19, 1949. 1 claim.

The patent covers a carton blank formed and hinged for folding into a receptacle. C.J.W.

RINGLER, WILLIAM A. Collapsible hexagonal container. U. S. patent 2,465,661. Filed June 13, 1945. Issued March 29, 1949. 1 claim. Assigned to Gardner-Richardson Company (now The Gardner Board and Carton Co.).

A polygonal container (suitable for hat boxes and the like) is produced by bending, cutting, and scoring boxboard to furnish blanks which can be tubed on the ordinary carton tubing machine. The method of cutting the blank and of forming the container are described. C.J.W.

SMART, SIDNEY K. Flap holding means for cartons. U. S. patent 2,467,702. Filed June 3, 1948. Issued April 19, 1949. 1 claim. Assigned to Shinners Packaging Incorporated.

The end closure of a carton is provided with a hole in the locking flap,

located in and intermediate the ends of the hinge line of its tongue and a slot in the hinge line of the side flap so cut as to form a small projection which will enter the hole when the tongue of the locking flap is thrust through the slot and hold the locking flap against accidental dislodgement. C.J.W.

WHITTAKER, ALVIN. Folding box. Canadian patent 455,628. Filed May 6, 1947. Issued April 5, 1949. 1 claim.

The patent covers a one-piece lock-corner box having a handle attached to one front by spring clips. C.J.W.

WILLIAMSON, MARSHALL I. Sealed reclosable carton end structure. U. S. patent 2,465,949. Filed Feb. 12, 1945. Issued March 29, 1949. 2 claims. Assigned to National Folding Box Company, Incorporated.

An end structure for a carton consists of an inner end, an outer side flap extending from opposite side walls, a top panel extending from the back wall and having a tuck flap connected with it, and a front flap extending from the front wall. The carton is originally sealable by adhesively securing the top panel to the front flap and securing the outer side flaps to the outside of the top panel. The container can be reclosed and reopened repeatedly. C.J.W.

INSULATION AND INSULATING MATERIALS

BOEHM, ROBERT M., and SIMPSON, GEORGE G. Method of making a conduit enclosing sheet product. U. S. patent 2,465,348. Filed March 31, 1945. Issued March 29, 1949. 9 claims. Assigned to Masonite Corporation.

Several blanks of Masonite stock are placed in a stack with a system of pipes (preferably copper tubing) placed at the desired position in the stack. Thermoactive adhesive materials can be placed between successive blanks in the stack. The stack is placed in a hot platen press and subjected to the desired temperature and pressure (depending on the density desired) while a fluid medium is passed through the pipes to assist in heating the interior of the pile. C.J.W.

LIME AND LIMESTONE

WHITE, FRANK S. Calcining lime bearing sludge. U. S. patent 2,465,410. Filed June 28, 1946. Issued March 29, 1949. 11 claims. Assigned to The Dorr Company.

Lime-bearing sludges (such as those from the causticizing operation of the pulp mill) are mixed with an adhesive (e.g., soda) which melts below the decomposition temperature of the sludge solids but does not become thermosetting at such temperature; the mixture is partially dried and preheated by the use of stack gases or hot products of the subsequent calcining combusion (about 1000° F.), treated with an oxygen-bearing gas which is passed upwardly through the mixture, and the product is added to a bed maintained at the decomposition point of calcium carbonate. C.J.W.

MACHINERY—CONVERTING MACHINERY

BILLEB, CLYDE K. Bagmaking machine. U. S. patent 2,467,879. Filed May 17, 1945. Issued April 19, 1949. 4 claims. Assigned to Milprint, Inc.

A machine is described for forming bags or pouches from a rapidly

advancing ribbon of paper, thermoplastic material, or the like; it provides maximum sealing periods at the seams and joints of the successive bags even when operating at very high speeds. C.J.W.

POPPE, GEORGE W. Paper bag tube severing machine. U. S. patent 2,466,823. Filed Oct. 11, 1946. Issued April 12, 1949. 7 claims. Assigned to Equitable Paper Bag Co. Inc.

The weakened tubulated web used for the formation of paper bags is simultaneously gripped between two sets of rollers with the weakened portion of the web interposed between the two sets. The timing of the rollers is such that the main body of the tubulated web is temporarily slowed down slightly while the bag blank to be separated is temporarily advanced at high speed. The pull thus produced effects separation of the bag blank from the remainder of the web which is immediately released and allowed to proceed at its normal speed. Means are provided to adjust the length of time that the tubulated web is slowed down to adapt the mechanism for the different production speeds incident to the formation of bags of different lengths. C.J.W.

VERGOBBI, JOHN G. Container forming machine. U. S. patent 2,466,341. Filed March 27, 1947. Issued April 5, 1949. 4 claims. Assigned to Pneumatic Scale Corporation.

An apparatus is described for forming a rectangular container having a face-to-face or fin-type seam. C.J.W.

MACHINERY—DRIVE

HORNBOSTEL, LLOYD. Fluid pressure operated device for use with clutches. U. S. patent 2,467,830. Filed April 26, 1945. Issued April 19, 1949. 1 claim. Assigned to Beloit Iron Works.

A split diaphragm is used; the diaphragm-carrying member comprises a pair of annular plates having mating peripheral surfaces co-operating to form registering arcuate openings and recesses to define with the diaphragm a fluid pressure chamber and to provide mating surfaces that bridge the parting line of the diaphragm. The diaphragm can be replaced readily and easily. C.J.W.

HORNBOSTEL, LLOYD. Paper machine clutch drive. U. S. patent 2,467,829. Filed March 22, 1943. Issued April 19, 1949. 7 claims. Assigned to Beloit Iron Works.

The invention relates to fluid pressure-controlled clutch drives for starting sections of a papermaking machine, the sections all being driven by a single prime mover. Compressed air-actuated clutches are provided between the inshaft and the line shaft of the machine for automatically starting the inshaft through a slip couple and then directly driving the inshaft when it has reached a predetermined speed. The clutch drives have a remote control, large thermal capacity, and variable starting torques. C.J.W.

MACHINERY—LAY BOYS

GANNON, IRVING J., and HARVEY, JAMES R. Blank aligning mechanism. U. S. patent 2,467,973. Filed Oct. 12, 1945. Issued April 19, 1949. 6 claims. Assigned to The Ohio Boxboard Company.

In a device for use with a cutting machine for cutting blanks of paper-

board carton blank sheets, guide means are provided for accomplishing approximate uniform edge alignment of the sheets as they are delivered from the cutting machine to form a pile and a mechanism for insuring the aligning and registering and for interlocking the cut carton blanks as they are delivered to the pile by depressing portions of the blanks adjacent to cuts therein with respect to adjacent sheets in the pile, including an oscillatable shaft, depressor means oscillatable with the shaft, and power mechanism for imparting oscillatory movement to said shaft. C.J.W.

MACHINERY—PAPER MACHINE—YANKEE TYPE

JAMES, BURTON E., and BEACHLER, EDWARD D. Combination papermaking machine. U.S. patent 2,467,556. Filed May 29, 1944. Issued April 19, 1949. 12 claims. Assigned to Beloit Iron Works.

The patent covers a combination papermaking machine adapted to produce creped paper or flat paper with no crepe. The principal object is to provide drive control means for regulating the driving effort transmitted to the driven sections so that the draw of the paper between the various sections of the machine will be properly tensioned regardless of the type of paper being made. Provision is made for speed-adjustable driving means whereby the several sections of the machine are definitely synchronized and are driven in proper speed relation to each other. The machine can be changed from flat to creped paper or the reverse by merely coupling and uncoupling the drives to certain sections of the machine. Various details of the machine are given. C.J.W.

MACHINERY—SAWS

BURT, GEORGE H. Sawing apparatus. U. S. patent 2,467,728. Filed Nov. 14, 1946. Issued April 19, 1949. 6 claims. Assigned to The Celotex Corporation.

A sawing apparatus is described for accurately subdividing a precut strip of material into a plurality of tilelike units which are square and uniform in size. C.J.W.

GRAFF, WILLIAM H. Pulpwood saw frame. Canadian patent 455,664. Filed Nov. 25, 1947. Issued April 5, 1949. 7 claims. Assigned to Henry Disston & Sons, Inc.

The construction of a tubular metal saw frame is described. C.J.W.

MACHINERY—SCREENS

BLIKSTAD, FINN, and PEDERSEN, ERLING. Method and apparatus for purifying fibre suspensions and the like. Canadian patent 455,431. Filed Jan. 11, 1946. Issued March 29, 1949. 11 claims.

The apparatus consists of a sandtrap and a flat screen located over the sandtrap with a partition wall dividing the space between the screen and the bottom of the sand trap into an upper and a lower portion. The unscreened pulp flows through the sandtrap in one direction at a low velocity and then along the flat screen in the opposite direction at a substantially higher velocity; the level difference between the unscreened and screened pulps is maintained substantially constant. C.J.W.

MACHINERY—WIRES

SCOFIELD, GILBERT J. Cleaning apparatus. U. S. patent 2,467,502. Filed May 23, 1945. Issued April 19, 1949. 1 claim.

In an apparatus for cleaning Fourdrinier wires, provision is made for directing a cleaning agent (such as water, steam, water and steam, or a chemical solution) onto the wire while it is in motion. The cleaning agent can be applied at any desired temperature and/or pressure. Provision is made for directing the agent onto the spot or zone of the wire that requires cleaning. C.J.W.

MATERIALS HANDLING

HORNBOSTEL, LLOYD, and BEACHLER, EDWARD D. Roll unloading apparatus. U. S. patent 2,467,555. Filed April 9, 1945. Issued April 19, 1949. 8 claims. Assigned to Beloit Iron Works.

An apparatus is described for unloading a plurality of wound rolls of paper from a single winder shaft in such a manner as to separate completely the rolls from the shaft and from each other. The rolls are deposited onto a driven conveyor and discharged from one end of the conveyor while holding the shaft against movement with the rolls; the leading roll is cocked or tilted relative to the next adjacent roll. C.J.W.

MOLDED PULP ARTICLES

COX, JOHN W. Molded pulp carton. U. S. patent 2,466,579. Filed Sept. 20, 1943. Issued April 5, 1949. 2 claims. Assigned to Shellmar Products Corporation.

Cellular egg cartons of the two-by-six type are molded of paper pulp to afford a receptacle having plane bounding walls and egg-receiving compartments partitioned from one another by upstanding projections molded on the receptacle bottom independently of the bounding walls and formed so as to strengthen and rigidify the carton structure as a whole (when opened or closed). C.J.W.

PAPER—COATED

LOBSTEIN, ROBERT. Coating apparatus. U. S. patent 2,466,718. Filed March 21, 1946. Issued April 12, 1949. 5 claims. Assigned (one half) to Samuel R. Hunter.

A method and apparatus are described for coating paper and other sheet materials by applying coating liquor to one or both surfaces of the material during the process of its manufacture before it is completely dry. Provision is made for regulating the thickness of the film without changing the specific gravity of the coating liquor and for smoothing the film after it has been applied by means of hot and cold rolls whereby the film will be uniformly distributed over the surface. The coating liquor may be a solution of glue, gelatin, casein, resin, or varnish in water or oil; it may contain fillers in suspension. The coating apparatus is placed between two sets of drying rolls. A vacuum drum dips in the coating liquor and transfers a film, through a series of applicator rolls, to the material. C.J.W.

PIAZZE, THOMAS E. Apparatus for controlling the coating applied to an object. U. S. patent 2,466,734. Filed May 4, 1945. Issued April 12, 1949. 2 claims. Assigned to Shellmar Products Corporation.

An apparatus is described for regulating and controlling an amount of viscous coating solution applied to a moving object—which utilizes a metering and smoothing member along which the viscous material will flow with means disposed on the member which rests against the object to be coated

while holding the member in spaced position from the object to permit the solution to flow, thereby metering the amount of solution applied to the object—and means along which the viscous solution continues to flow after metering, thus smoothing and spreading the same into a coating of substantially even thickness against a moving object. A relatively thin and flexible metering and smoothing blade is used; the blade has a plurality of projections of substantially equal magnitude disposed along the blade. C.J.W.

PAPER SPECIALTIES

ANDREWS, DAVID B. Package and packaging material therefor. U. S. patent 2,467,875. Filed Jan. 7, 1947. Issued April 19, 1949. 6 claims. Assigned to Marathon Corporation.

A cheese wrapper consists of a base sheet (paper, glassine, or the like), a coating adhered to the surface of the base sheet adjacent to the cheese, and a tearing element embedded in the coating. The tearing element is formed at an edge of the base sheet to provide a grasping tab. C.J.W.

BARBIERI, CESARE. Container. Canadian patent 456,168. Filed March 3, 1947. Issued April 26, 1949. 8 claims. Assigned to Dixie Cup Company.

This patent covers a composite blank for forming a flat-bottom paper cup having a double-ply wall and a roller rim at the mouth end. C.J.W.

BONINI, JOHN H. Package. U. S. patent 2,465,841. Filed March 15, 1946. Issued March 29, 1949. 1 claim. Assigned to Marathon Corporation.

A wrapper for overlapped bacon and similar limp products consists essentially of a wrapper made of a flat scored blank such as cardboard and a flexible rectangular sheet of cellophane, greaseproof paper, glassine, and the like. The construction of the package is described. C.J.W.

BROOKS, LEWIS C. End closure for paperboard containers. U. S. patent 2,465,842. Filed March 12, 1945. Issued March 29, 1949. 2 claims. Assigned (one third) to Ira M. Jones.

This is a continuation of U. S. patent 2,398,405 (April 16, 1946) and relates to a sealing closure for a molded pulp or other container of square cross section. The closure consists of a relatively thin sealing sheet placed across the open mouth of the container and wedged into place by a stiff insert or disk to which it is bonded and of a size and shape to fit snugly the sides of the rim above the ledge without projecting above the top of the rim. The combination is united by means of an adhesive (e.g., a synthetic wax) or by Scotch tape. C.J.W.

CARLTON, RICHARD P. Apparatus for the manufacture of abrasives. U. S. patent 2,463,241. Filed May 19, 1945. Issued March 1, 1949. 8 claims. Assigned to Behr-Manning Corporation.

In the manufacture of sandpaper, emery paper or cloth, and the like, provision is made for creating a magnetic field to cause the abrasive material to stand substantially erect on a carrier surface and for bringing an adhesive-coated surface into embedding contact with the abrasive particles. This is a continuation of U. S. patents 2,318,570 (May 4, 1943) and 2,376,342 (May 22, 1945). C.J.W.

CARLTON, RICHARD P. Coated abrasive article. U. S. patent 2,463,242. Filed May 21, 1945. Issued March 1, 1949. 1 claim. Assigned to Behr-Manning Corporation.

An abrasive sheet material comprises a backing and a layer of abrasive particles of various shapes and sizes bonded thereto by an adhesive binder coat, all the particles having their major axes parallel and perpendicular to the plane of the backing and having their exposed ends lying in a common plane parallel to the plane of the backing. This is a continuation of U. S. patents 2,318,570 (May 4, 1943) and 2,376,342 (May 22, 1945). C.J.W.

HAMILTON, FREDERICK, ISAACS, ELIAS, MORGAN, LESLIE B., and TOUT, ALAN F. Process for treating paper. Canadian patent 455,698. Filed May 2, 1946. Issued April 5, 1949. 8 claims. Assigned to Imperial Chemical Industries Limited.

The strength of paper is improved by impregnating it with 0.5 to 10% aqueous solution of an interpolymer of methacrylic acid and methyl methacrylate, followed by heating to a temperature between 60 and 100° C. Other polymers are specified. C.J.W.

MULLINIX, CHARLES D. Moistureproof package. U. S. reissue patent 23,096. Filed Nov. 22, 1944. Issued April 5, 1949. 12 claims.

This is a reissue of U. S. patent 2,335,019 (Nov. 23, 1943) and relates to a package for butter, oleomargarine, bacon, and other greasy foods. The package is made of laminated paper blanks having at least two layers and bonded by paraffin and latex or other moistureproof adhesive. C.J.W.

NEUMANN, SALOMON. Pre-gummed paper, fabric and other material. Canadian patent 456,245. Filed Feb. 16, 1945. Issued April 26, 1949. 2 claims. Assigned to Shand Kydd Limited.

In the manufacture of pregummed paper (especially wallpaper), the rear side of the paper is coated with an aqueous suspension of starchy material which is normally not soluble in cold water, the coated material is heated to a temperature such that the starch swells and becomes cold water soluble, and the product is then dried. C.J.W.

NEWMAN, DOUGLAS A. Manifolding. Canadian patent 455,502. Filed Jan. 4, 1946. Issued March 29, 1949. 9 claims. Assigned to Columbia Ribbon & Carbon Manufacturing Company.

A method is described for producing wax-carbon transfer areas on manifolding or duplicating sheets by printing such areas with an ink composition containing dispersed unmelted wax particles and then applying heat to the printed areas to melt the wax. C.J.W.

RAPP, MELVILLE B. Decalcomanias. U. S. patent 2,465,927. Filed April 13, 1946. Issued March 29, 1949. 1 claim.

The invention covers a plurality of separate decalcomanias arranged in substantially coplanar relation, each including an ink film on one surface of a backing sheet and a perforated sheet member permanently adhesively joining the other surfaces of all the backing sheets over the ink-film region; the adhesion is unaffected upon application of moisture to the backing members through the perforations of the member to release the ink film on the various backing sheets. C.J.W.

SMITH, MARION F., and GREIDER, HAROLD W. Manufacture of asbestos sheet material. U. S. patent 2,467,540. Filed Jan. 15, 1945. Issued April 19, 1949. 1 claim. Assigned to The Philip Carey Manufacturing Company.

A sheet of asbestos paper which is free of organic binder is formed by treating a sheet of the bonded asbestos fibers containing less than about 5% of moisture with a 10-30% aqueous solution of hydrofluoric acid (by transfer rolls, spray, tub sizing, or the like) and drying the paper (e.g., at 200-300° F.). In place of the acid, salts of the acid can be employed. The treated sheets have high tensile strength. C.J.W.

PLASTICS—PAPER-BASE

PRANCE, ALVIN W., and LYIJYNEN, FRED. Method for making decorated laminated articles with contoured surfaces. U. S. patent 2,466,966. Filed July 7, 1944. Issued April 12, 1949. 5 claims. Assigned to Briggs Manufacturing Company.

Laminated articles having a contoured conformation are prepared by applying a printed design or pattern to a substantially planar cellulosic sheet, drying the same, and impregnating the same with a liquid resin varnish in such a manner as to form a coating of the resin over the design or pattern, superimposing the dried sheet upon a laminated foundation board preshaped under pressure to substantially the final shape of the article, and compressing the assembly between heated mold members. C.J.W.

ROSEBAUGH, THEODORE W. Resin impregnated article. Canadian patent 455,564. Filed June 16, 1945. Issued March 29, 1949. 7 claims. Assigned to Shell Development Company.

A laminate is formed from α-cellulose sheets (with less than 2% moisture) impregnated with an infusible resin of an unsaturated polyester of an aromatic polycarboxylic acid having at least one carboxyl group esterified with an allyl type alcohol, the laminate being cured at a temperature between 50 and 250° C. and a platen pressure of not more than 1 p.s.i. The ester may be diallyl phthalate. C.J.W.

PULP STONES

BETH, HUGO W. H. Pulpstone. U. S. patent 2,467,878. Filed Aug. 1, 1946. Issued April 19, 1949. 2 claims. Assigned to Norton Company.

The present pulpstone construction is an improvement over that of Thure Larsson as described in U. S. patent 2,141,608 (Dec. 27, 1938). The pulpstone consists of a plurality of bonded abrasive material arranged to form a hollow cylinder of revolution and a hollow concrete core within the cylinder. Means are provided for attaching the blocks to the concrete core. C.J.W.

RAYON

VAN HALEWIJN, ARIE. Dissolving apparatus for the preparation of cellulose solutions. U. S. patent 2,466,649. Filed Dec. 4, 1946. Issued April 5, 1949. 1 claim. Assigned to American Enka Corporation.

This is an improvement over U. S. patent 2,289,085 (July 7, 1942) and relates to a method of dissolving cellulose in a salt solution such as a zincate

or stannate. An apparatus is provided in which the mixture is cooled and agitated to effect the solution of the cellulose. C.J.W.

SEMI-CHEMICAL PULPING PROCESS

CODWISE, PHILIP W. Fibrous material and process of producing the same. Canadian patent 455,655. Filed June 20, 1941. Issued April 5, 1949. 3 claims. Assigned to Certain-Teed Products Corporation.

Bundles of vegetable fibers are subjected to the action of steam at about 212° F., mechanically defibrated to individual fibers while in the steam, and treated with a chemical capable of modifying the incrusting materials; a substantial removal of these materials is effected by a further mechanical action. C.J.W.

VERNEREY, ALBERT, and MOUSSELIN, RENÉ. Process for grinding wood shavings and the like. Canadian patent 456,057. Filed Jan. 28, 1947. Issued April 19, 1949. 2 claims. Assigned to Société Anonyme pour la Fabrication d'Isolants et Revêtment ligneux "Isorel."

Wood shavings are subjected to the combined action of steam and grinding disks in the presence of ammoniacal salts which are easily dissociated under the temperature conditions prevailing in the apparatus, thereby hydrolyzing certain polyuronides and polysaccharides. The salts can be injected into the grinding apparatus as a hot water solution. C.J.W.

SETUP BOXES

WEBB, DENNIS G., and WEBB, FRANK E. Cardboard box. Canadian patent 456,065. Filed Jan. 23, 1947. Issued April 19, 1949. 4 claims. Assigned to George Webb & Sons (Northampton) Limited.

A shoe box is fitted with a flap foldable into the box, the flap having attached to it an intermediate portion of a length of sheet material, the end portions of such length being available for packing purposes. C.J.W.

SHIPPING CONTAINERS

BEATTIE, ROBERT. Method of making fiber containers with metallic closures. U. S. patent 2,467,182. Filed April 1, 1946. Issued April 12, 1949. 6 claims. Assigned to Tide Water Associated Oil Company.

The invention covers containers for oils or other liquids with end closures of relatively thin-gage metal; provision is made for the distribution of an adhesive sealing composition in predetermined desired areas between the end closure and the body portion after the end closure has been applied. C.J.W.

BELSINGER, JACK R. Easy packaging container. Canadian patent 456,134. Filed Aug. 15, 1947. Issued April 26, 1949. 2 claims. Assigned to Belsinger, Inc.

This is equivalent to U. S. patent 2,453,614 (Nov. 9, 1948); *cf.* B.I.P.C. 19: 374. C.J.W.

COYLE, JOHN. Paper container structure and method of forming same. U. S. patent 2,467,930. Filed Jan. 14, 1944. Issued April 19, 1949. 5 claims. Assigned to Continental Can Company, Inc.

A method is described for forming a container of paper having a paneled or polygonal main body portion and cylindriform end portions in which the end closures are adhesively attached. C.J.W.

DUNLAP, CHARLES K. Fibrous container for oil and other liquids. U. S. patent 2,467,016. Filed Feb. 16, 1944. Issued April 12, 1949. 4 claims. Assigned to Sonoco Products Company.

The main conical body of the shell, which can be formed by winding a paper blank upon itself about a suitable mandrel with a suitable adhesive applied between the convolutions of the paper, is lined throughout its entire inner wall surface with glassine paper which is bonded to the tube by an oil-proof adhesive, such as plasticized animal glue; sodium silicate or starch can be applied in some instances. The lining can be applied either during the rolling formation or after the tube is formed. C.J.W.

HATCH, ALEXANDER G. Method of making sealed fibre container and closure therefor. Canadian patent 455,508. Filed July 16, 1946. Issued March 29, 1949. 5 claims. Assigned to Continental Can Company, Inc.

A can closure is formed by laminating a strip of cap stock and a strip of sheet material impervious to selected fluid, drawing therefrom a cap having a disk portion and a peripheral flange depending from the disk portion, applying to a portion of the disk and flange a normally nonviscous thermoplastic adhesive rendered viscous by heat, and causing the adhesive to form into a ring of excess thickness at the juncture of the flange and the disk. C.J.W.

MAIER, CURTIS E., BROCKETT, HALFORD E., and MINNEAR, FESTUS L. Lined lapped seam fibre container and method of making the same. Canadian patent 455,660. Filed Oct. 4, 1946. Issued April 5, 1949. 26 claims. Assigned to Continental Can Company, Inc.

A lined lap-seam fiber container body consists of a fiberboard base of sufficient dimensions to form a body having narrow lapped seam portions and a liner dimensioned so as to cover substantially at least one face of the base, the base and liner being bonded by a stable nonbrittle adhesive and the lapped seam portions being bonded together in a side seam by a similar adhesive which is substantially free of any tendency to cold flow. C.J.W.

STARCH

KESLER, CARL C., and HICKS, WILLIAM L. Method of preparing an adhesive from cereal flour. U. S. patent 2,466,172. Filed May 10, 1945. Issued April 5, 1949. 6 claims. Assigned to Penick & Ford, Ltd., Incorporated.

The cereal flour in water is adjusted to a pH of 9-10 with alkali, heated at about 130° F. to inactivate the naturally occurring enzymes, further heated at 170-210° F. to cook the starch, and adjusted to a pH of 5-7. It is stated that the starch is gelatinized without substantial modification and is thus produced in a uniform and predetermined viscosity. C.J.W.

TALL OIL

GIESEKE, ELMER W. Froth flotation of nonmetallic ores with black liquor soap in acid circuit. U. S. patent 2,466,671. Filed Sept. 22, 1945. Issued April 12, 1949. 2 claims. Assigned to American Cyanamid Company.

In the froth flotation of phosphate ores, black liquor (tall oil) soap is used as a collector, the pH being maintained between 6.7 and 4.0 in the tailing water; this acidity is not sufficient to liberate the free acids from the soap. C.J.W.

HERKENHOFF, EARL C. Froth flotation of iron ores. U. S. patent 2,466,987. Filed June 10, 1944. Issued April 12, 1949. 4 claims. Assigned to American Cyanamid Company.

Tall oil is used as an anionic-type promotor in the froth flotation of iron ores. C.J.W.

TEXTILE INDUSTRY AND FABRICS—FIREPROOFING

POLLAK, FREDERICK F., and FASSEL, JOSEF. Manufacture of waterproof and water-repellent noninflammable fibrous materials. U. S. patent 2,464,342. Filed April 16, 1943. Issued March 15, 1949. 5 claims.

The material is impregnated with an aqueous solution of ammonium pyrophosphate and a melamine-formaldehyde condensation product and dried at an elevated temperature (about 120° C.), thereby forming a water-insoluble melamine pyrophosphate. C.J.W.

ROSSER, CHARLES M. Plasticizer, composition containing the same and process. Canadian patent 454,948. Filed Oct. 17, 1946. Issued March 8, 1949. 2 claims. Assigned to American Viscose Corporation.

A regenerated cellulose is impregnated with sufficient guanidine thiocyanate to plasticize it and render it fire retardant. C.J.W.

WESSON, ALEXANDER J., and OLPIN, HENRY C. Fire-resistant organic fibrous materials containing ethylene diamine di-hydrobromide. U. S. patent 2,464,360. Filed June 5, 1946. Issued March 15, 1949. 5 claims. Assigned to Celanese Corporation of America.

The fireproofing agent is the hydrobromide of ethylenediamine or other polyamines such as diethylenetriamine or tetraethylenepentamine. Although of most value for fabrics containing cellulose acetate or other cellulose esters and ethers, the reagent can be applied to paper, cotton, linen, etc. C.J.W.

WASTE LIQUOR

BOEHM, ROBERT M., and HALL, HORACE E. Recovery of sugar precursors. U. S. patent 2,465,347. Filed March 31, 1944. Issued March 29, 1949. 8 claims. Assigned to Masonite Corporation.

The pentosans and hexosans contained in the aqueous solution obtained from the Masonite process are precipitated by the addition of a mixture of about four parts of acetone to one part of isopropyl ether, using about four parts of the mixture to one part of the aqueous solution. The pH may range from 2 to 11 but best results are obtained at a pH of 5.5. The precipitation can be accelerated by the addition of from 1 to 5% of an electrolyte (e.g., aluminum sulfate). C.J.W.

WET STRENGTH

WEXLER, ABRAHAM, and MEMSTEAD, HEMEL. Manufacture of paper or like fibrous material. Canadian patent 455,710. Filed Nov. 16, 1942. Issued April 5, 1949. 6 claims. Assigned to Harold Jackson Limited.

Wet strength is imparted to paper and like fibrous material by incorporating therein a relatively high proportion of a hydrated silicon compound; this is accomplished by treating the material with a solution of a soluble silicate, partially drying it, and treating the partially dried material with an acid.

C.J.W.

Book Review

ROBINSON, HOWARD A., ed. High-polymer physics, a symposium, published under the auspices of the American Institute of Physics. Brooklyn, etc., Chem. Publ. Co., Remsen Press Division, 1948. 572 p.

The papers in this volume were presented at the High Polymer Division of the American Physical Society in New York, January, 1946. Most of the 23 papers have been published earlier, 13 in the *Journal of Applied Physics.* Five of the papers appear in print for the first time. In assembling these papers the editor has emphasized the need for co-operative attack on high-polymer problems by chemists and physicists. Many of the researches described represent joint efforts of this kind. Included in the topics discussed are molecular structure and physical and physico-chemical properties of glasses, natural and synthetic rubbers, drying oils, cork, certain textiles, and synthetic resins. With a few exceptions the papers represent results of a particular investigation rather than a review and critical evaluation of the present status of a given field. Outstanding in the latter class, however, are treatments of (1) mechanical properties of textiles, by H. Eyring and G. Halsey, (2) theory of relaxing polymeric media, by M. S. Green, A. V. Tobolsky, and P. J. Blatz, (3) crystallization of unvulcanized rubbers, by L. A. Wood and N. Bekkedahl, (4) determination of polymer-liquid interaction by swelling measurements, by P. Doty and H. S. Zable, and (5) thermodynamic properties of cross-linked gels, by R. F. Boyer and R. S. Spencer. Instrumentation in polymer research receives attention in articles describing equipment for measurement of the light scattering of dilute polymer solutions, thermal diffusion of polymer solutions, tackiness of elastomers, and electrostatic properties of rubbers. Papers of particular interest to the research man in the pulp and paper industry include those on: (1) mechanical properties of textiles, by H. Erying and G. Halsey, (2) dimethylsiloxane polymers, by A. J. Barry, (3) ionized water films on dielectrics under conditions of high humidity, by R. F. Field, (4) theory of relaxing polymeric media, by M. S. Green, A. V. Tobolsky, and P. J. Blatz, (5) tackiness of GR-S and other elastomers, by W. F. Busse, J. M. Lambert, and R. B. Verdery, and (6) x-ray diffraction investigation of some polygalacturonides, by K. J. Palmer. This volume is not intended as a text or introduction to high polymer physics. Inherent in a symposium of this type is a lack of continuity between many of the topics which cannot be overcome editorially in publication. In the reviewer's opinion the book admirably fulfills its stated purposes of collecting in one place some of the research results not readily available during the war and of bringing together more closely viewpoints of physicists and chemists who are active in the immense field of polymer research. It will be of particular value to the worker without ready access to the journals in which the papers originally appeared.

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